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The Wealth of India.

The object of this Monthly is to publish the views of experts on the various problems bearing on material progress, specially agriculture, commerce, industry, economics, co-operation, banking, insurance, popular, scientific and technical education, to digest the notable articles appearing in the leading magazines and periodicals and generally to serve as a record of practical information, and useful discussions. It is believed such a publication is indispensable to statesmen, publicists, businessmen, students of economics and all others interested in the material and moral advancement of the country.

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Current Topics

BY ECONOMICUS.

Banking Legislation.

The enormous loss inflicted by the failure of so many banks and the unexpected and unwelcome discovery of certain serious flaws in the existing and commonly followed system of bank promoting and bank management have forced upon the attention of the public the urgency of putting legal restrictions upon banking operations. The subject was, indeed, under the consideration of Government some time before the crisis started in the Punjab, but the immediate necessity of taking prompt and decisive measures to prevent the recurrence of a similar financial crisis, as far as it is possible for legislation to compass that end, has become still more pressing in the light of the occurrences of the last month and a half. In a time of crisis, one is inclined to suggest drastic remedies, but in the present instance it has to be borne in mind that heroic measures that may tend to prove prejudicial to the permanent interests of the progress of credit, must be at once deprecated as unwise and uncalled for. That the country is in need of extensive banking fecilities and that joint stock banking is yet in a state of infancy among us, are propositions that do not require much argument to make them convincing. It cannot be denied at the same time that in the interests of the public and of the development of credit itself, some kind of regulation of banking methods is called for,

The important question is, how are these two things to be reconciled ? It will be recollected that in August last the Government of India addressed a letter to local Governments and public bodies interested in the question, to elicit their views on certain tentative measures they proposed in the matter of banking legislation. The replies of some of the commercial bodies which have been made public, go to show the trend of opinion in that quarter. For example, the Committee of the Bombay Chamber of Commerce favour the introduction of a Bill of a simple character, which, in some measure, will give protection to shareholders and depositors, for, in their opinion, successful banking is really a question of experience and good management in matters pertaining to banking and the safe custody of other people's money, and if this is assured and if the directors are competent and thoroughly understand their business, there is really no necessity for legislation of a stringent character which might retard development and in some degree hamper the success of sound and well managed banking institutions. They agree with the government in thinking that all institutions calling themselves banks, banking companies, banking corporations and so forth, should be brought under the provisions of the Indian Companies Act, but that these restrictions should not be applied to firms and individuals trading as shroffs or bankers. It is easy to imagine what prestige is enjoyed and confidence created in the public mind by firms assuming the appellation of bank which has a potent charm powerful enough to attract large deposits. Their transactions are on a large scale and their responsibility heavy. It is but meet and proper, therefore, that they should be subjected to reasonable legal restrictions, while small firms and individuals carrying on business on a petty scale may be left free, because their power for mischief is not great and it would not be possible to bring them under legal regulation. They also serve a useful social and economic purpose in their own way. The same reasoning would lead to the conclusion that the prescription of a minimum subscribed capital is not necessary. In view of the misapprehension of the real position of a bank caused in the public mind by flaring advertisements about colossal amounts of authorized capital that are displayed to attract deposits, the Bombay Chamber suggests that at least 50 per cent. of the subscribed capital should be paid up within one year, that there should be some limitation or check on authorized capital and that there should be fixed some reasonable proportion between the authorized, subscribed and paid up capitals. In order to obviate the risk involved in the full allocation of profits to dividends pending the building up of an adequate reserve, some sort of limitation regulating the dividend, say to 5 per cent., until there is built up an amount of reserve fund bearing a particular proportion to the capital of the bank has been suggested. The Bombay Committee is divided on the question and has no specific proposal to make on the point. One of the objectionable features of the present practice is that concerns whose main business is banking, engage in other kinds of business also such as trading, insurance, shipping and so forth, and in these transactions the profits arising from pure banking operations are lost. Under the circumstances banks ought to be precluded from doing business outside their legitimate sphere. Another source of mischief lies in the practice that is but too common to advance money to the bank's officers and the Directors. There is no reason, so far as we can see, why this should not be prevented. Of course, however stringent the law and minute the regulations, means will be found to evade them or render them futile. But we feel that the time has come to take early steps to safeguard the interests of the investing and depositing public as far as it is possible to do so. The question must be viewed from every standpoint and completely threshed out so that government may be in possession of the well considered opinions of all those who are, in any way, concerned in the matter.

Banking Crisis.

Even now it is too early to estimate accurately the financial and economic effects of the terrible crisis through which the Punjab and Bombay have just passed. The crisis, as such, is indeed now over and the panic has been completely allayed. The banks and commercial concerns are conducting their normal operations and the money market has re-assumed its quiet tone. Now and again, we, no doubt, hear of a banking failure and a commercial insolvency, and are reminded that the volcano has not yet become quite extinct. But crises which come suddenly and more swiftly have a brief existence, and though their after effects are serious and far-reaching, the recouping power which society possesses asserts itself, and the panic vanishes like an ugly dream. The Bombay Share Bazaar has resumed its normal course and the brokers are doing their usual business. The November settlement stranded a considerable number of share-dealers and extreme caution is the key note of the transactions of the money market. By this time more than half a dozen Indian Joint Stock Banks have come to grief plunging lakhs of people into despair and ruin. When the first crash came, deep sympathy was naturally felt for the promoters and conductors of the banks whose inability to meet immediate liabilities was attributed to the sudden run of depositors. No bank, however sound, would be able to stand a continuous strain of this sort and there was, for a long time, a talk of reviving and reconstructing the concerns. Assurances were given that the position of some of the banks was perfectly sound and it was asserted that winding them up would be a national disaster. It would deal a heavy blow to indigenous banking and set back the hands of the industrial clock. Such a representation of the situation aroused public sympathy and people were willing to hold their souls in patience and even to make large sacrifices. But all this writing and altruism, inspired in many cases by enlightened self-interest has become bootless. We are not here concerned with any but the financial and economic aspects of the exposure that has been made in the law courts and outside, of the condition and the conduct of some of the banking concerns which are now in the process of liquidation. But we must refer to some of the features of these revelations in the interest of the industrial and economic progress of the country. The story of these banks is the record of mismanagement, negligence, a reckless indifference to the interests of the depositors, if not of some thing worse. The public has been led to invest their hard earned savings in the banks and they have been frittered away on speculations. The directors did not do their duty by themselves, and the depositors to whom they were responsible, were, some of them, ruined. Few of them seem to have taken their position seriously and to have devoted to their proper work the time and the energy they were bound to devote. The directors, it must be borne in mind, are not mere ornaments, meant only for show. Their innocence cannot exonerate them from their moral responsibility. If they know nothing of banking, they have no business to lend their names to company promoters, and if they cannot spare the necessary time, they had better make room for other people. Then again, one can understand a calamity which may sometimes overtake a banking concern for no fault of the management and in circumstances over which they have no control. Public sympathy will go out to these people. But the revelations that have been made of the methods of certain banks tell a different tale. It is easy to say that the depositors ought to keep a vigilent eye upon the transactions and the condition of the concern where they put their money for safe keeping or for earning interests and they have but to thank themselves if they lose. But is it possible, we ask, for the common or even an intelligent depositor to ascertain the position of his bank? What can he know about the intricacies of the accounts and the manner in which they are prepared and presented? Every six months the shareholders and depositors are

told of the flourishing condition of the banks' affairs and a substantial dividend is declared. The 'window dressing' and whitewashing that go on, are beyond the intelligence of the average person. The serious aspect of the situation is that, not only have trade and commerce been inconvenienced and hampered owing to the curtailment of credit, but public confidence, which is a priceless asset, has been absolutely shattered. A large quantity of potential capital has been already lost and we shall not be astonished if within the next few years the deposits with postal savings banks and the presidency banks become inflated. The illiterate and backward classes in India do not even now understand the value and usefulness of banks. It was the educated section of the community which had latterly taken largely to keeping their savings in credit institutions, and now that their confidence is shaken, it will take a long time to restore it. The function of the Indian banks is to collect the small savings of a large number of middle class people and to lend them to trade and industry. It is difficult to imagine the financial loss which has fallen upon persons of small means and the hardship which has been caused to them. The recent crisis has exposed certain dark spots upon company management and not only must they be wiped off but immediate steps must be taken to prevent the recurrence of a similar calamity. The question is already engaging the attention of Government and we expect, in the near future, certain safeguards provided for ensuring the protection of the depositor. Legislation alone will not, however, solve the problem and it must be reinforced by the development of a sense of responsibility and by the growth of knowledge among the people. We have urged the need of a searching public enquiry to be ordered by Government into the methods and transactions of the banking concerns which have recently been closed. The object of the investigation is the bringing out of the true state of things. Allegations have been made in the press against some people connected with the banks and there have been a few rejoinders What we should like to have is the ascertainment and publication, in an authoritative manner, of the truth, the whole truth and nothing but the truth. This has been partly done by the information which has come before the law courts in Bombay and elsewhere. The public will, however, derive much benefit if this is done in a more systematic and satisfactory manner. The question is not so much of the persons that are involved as of the system and the methods which appear to be in vogue in the banking world. These require to be exposed and properly corrected.

Indian Currency.

It must have been a very interesting gathering, the meeting of the East India Association at the Caxton Hall when men holding such divergent views on the question of Indian currency as Mr. M. De P. Webb, Sir James Wilson, Mr. Sundaram Iyer, Mr. Moreton Frewen and Mr. Reginald Murray aired their opinions on that subject. The occasion was a paper read by Mr. Webb on 'Money Power for India' with Sir James Wilson in the chair. The views of Mr. Webb are too well-known in India to require repetition here. They may be summed up thus:—'We should therefore equip India with the best conceivable monetary system and machinery. The open gold mint system of Great Britain supplemented by a State paper currency and good banking facilities, represented the farthest stage in monetary progress to which mankind had attained. Accordingly, we ought at once to establish in India an open gold mint, a full-value gold currency, and the best possible banking machinery'. Sir James Wilson holds, on the other hand, that there is no need to coin sovereigns in India having regard to the enormous absorption of these coins and of gold bullion by the country. There are quite enough coins in India to meet all necessary demands and his advice to Government is that they should not coin any more rupees. We may here point out as regards the large absorption of sovereigns in India that there is no guarantee that such absorption will continue; that is to say, the

influx of gold bullion and sovereigns, depending as it does, on the balance of India's trade and the indebtedness of foreign nations to this country, will be regulated by our exports and may decline at any time. Then as regards his second point that the Government of India should not coin any more rupees, seeing that there are in existence at the present moment no less than 250 crores of these coins of merely token value, it is difficult to understand how Government can help coining more rupees from time to time in conformity with Sir James' advice. It has undertaken the responsibility to give rupees in exchange for gold that may be tendered. Every year a certain quantity of silver coin is absorbed in the country, the stock of rupees with Government steadily becomes depleted and it is compelled to coin rupees enough to meet the requirements of trade. The unautomatic character of the token coin is responsible for much of the embarrassment of Government and it must either throw the mints again open to silver or demonetise silver to a limited extent. Both these measures are antagonistic to the present policy though the latter is not inconsistent with it. A more extensive use of currency notes and sovereigns will make additions to the rupee currency unnecessary as Sir James wishes, but in spite of the greater popularity of the other forms of currency, rupees are in demand and Government has to supply it. Sir James suggests that the gold standard and paper currency reserves should be amalgamated and reduced to fifty millions, the balance of eighteen millions being spent on railway and canal works. Mr. Sundaram Iyer represented the purely Indian as distinguished from the Anglo-Indian view and observed that recent discussions had largely resolved themselves into a squabble between the London and the Anglo-Indian banker as to who should have the use of the Government balances and the tendency had been to overlook the needs of the Indian people. It is well-known that Mr. Iyer does not want a gold currency which he thinks is unnecessary and would prove wasteful. Mr. Moreton Frewen is an out and out silverite and an advocate of a policy of open mints The discussion of Mr. Webb's paper only goes to show what a wide divergence there is even among experts on the complex question of Indian currency and it is by no means an easy task which the Chamberlain Commission have before them.

Mr. Chintamani on Swadeshi.

As President of the Seventh United Provinces Industrial Conference held at Fyzabad some time ago, Mr. C. Y. Chintamani, Editor of the *Leader* of Allahabad, delivered a stirring and thought compelling address which deserves to be carefully read and digested by every educated person, young and old. Mr. Chintamani is not himself a man of Commerce or Industry. But in his capacity as Assistant Secretary, of the Indian Industrial Conference, he worked hard to get into intimate touch with the economic and industrial condition of the people in the various provinces of India and has attained a thorough grasp of that problem. He is, besides, a sincere social reformer and an ardent political worker. The economic questions which confront India to day cannot be thought out and solved in isolation, independently of the other aspects of national life. A keen insight, a broad out-look and intimate knowledge are combined in Mr. Chintamani with frankness of utterance, sincerity of purpose and fervent public spirit. His reading of the present industrial situation is remarkably correct as his utterance is unfaltering and outspoken. Mr. Chintamani's observations on the proposal of Sir Fazulbhoy Currimbhoy Ebrahim about the establishment of a new body to take the place of the existing Industrial Conference are apposite and deserving of careful consideration. The most interesting feature of his address is, however, his analysis of the Swadeshi movement in India, and an account of its rise, development and present position. That the Swadeshi spirit has everywhere cooled down is apparent to the most superficial on looker, and that in spite of its comparative failure to day, the movement has done some good cannot be denied. "To utter the plain truth in plain language," says Mr.

Chintamani, "we now really hear little of the Swadeshi movement, except for the organization of an annual Mela in one city or the adoption of the customary resolution at the Congress and the Conference. Articles of every day use made in India are not much more easily procurable to-day than they were eight years ago; their quality, when they can be had, is still inferior; and as for the formation of new companies, why, gentlemen, have not things come to such a pass that it is only a more than ordinarily courageous man who can have the handihood to go before people with a business proposition and ask for their money to help in its materialisation?" Who will say that this is not a true though a sad picture of swadeshism as we have it to-day? Mr. Chintamani proceeds to point out the mistakes which are responsible for the existing state of things. The first mistake, according to him, was that undue prominence was given to and much the larger share of attention bestowed upon consumption while the real problem was production. If more attention had been paid to production, if an organized effort had been made to ensure supply, and if the exhortation to use indigenous in preference to imported goods even at some sacrifice had followed that constructive work, where such an appeal might have been found to be necessary, Mr. Chintamani feels certain that to-day instead of lamenting failure we could have met to congratulate ourselves on the good work we had been privileged to do. This need not be ridiculed away as being wise after the event. In selfsame words the warning had been uttered when the Swadeshi enthusiasm was at fever heat, but in the flush of zeal and haste, it was heeded not. The history of the Swadeshi movement for the past eight years is a history of failures. As one surveys the situation, one does meet with a gleam of success here and there, but all else is dismal failure and disappointment. We would commend to the earnest perusal of our readers the analysis of the situation Mr. Chintamani has attempted. Mr. Chintamani is not, however, a pessimist and would have no patience with any one who will preach inaction because of our failures. That is an effiminate idea. He has also given a few practical hints, as to the directions in which India has to work her way up by patience and perseverance. Mr. Chintamani concludes his speech by telling us what measures the people may take to help themselves and how the State may help them in their endeavour.

Special Articles.

VARIATION OF PRICES IN INDIA FROM 1300 TO 1912.

BY M. BALKISHNA, M.A., F.R.S.S., *Professor of Economics, Gurukula, Hardwar.*

The earliest record of Indian prices known to me goes back to the time of Alla-ud-din Khilji (1295-1315). That Emperor inaugerated his sumptuary reforms, very nearly from the year 1305. But the monarch who united in himself the ambition of Alexander and Muhammad, a man of blood and iron, the scourge of God, who like a comet had alternately inspired the terror and admiration of his subjects was, however, so helpless by the year 1310, that he became a slave of his slave, Malik Kafur who had secretly and successfully contrived to get all the power of the State into his hands. When the strong hand of the monarch was withdrawn, anarchy began to prevail throughout the length and breadth of the Empire. Hence it is clear that the prices forcibly fixed by law during those five years could not last any longer. It is not exactly known whether the prices given below are law-fixed or normal and competitive prices. If the former—and in our opinion it is a fact, we ought to make an addition of at least ten per cent. to the given prices in order to

approximate them to the then market prices—the prices that would have been current in the market, had not the zealous Alla-ud-din gone out of his way to fix them lower than what prevailed in the market so that his overwhelming army amounting to 465,000 men might be cheaply fed.

In passing, it may be remarked that this is the most important example of the regulation of prices by law in India and we think that it is the first and the last instance of its kind practised by Muhammadan kings in this country. That the regulation was short lived and even in the few years of its existence, the Emperor had to inflict exemplary punishments on persons guilty of transgressing the law in this respect, proves beyond doubt the infutility of law and custom and the supremacy of competition in fixing prices.

TABLE I.

Prices in the beginning of the 14th century.

Articles.	Price per maund of 28·8 lbs. in *Jitals.*	Reduced to modern maund of 82 lbs. in *pice* (64 pice = Re. 1 = 1s. 4 *d*).	Market price in Modern money by addition of 10 per cent.
1	2	3	4
			pice.
Wheat ...	7½	32·25	35·475
Barley ...	4	17·25	18·975
Rice ...	5	21	23·1
Pulse ...	5	21	23·1
Gram ...	5	21	23·1
Moth ...	3	13	14·3
Fine sugar ...	60	255	280·5
Raw sugar ...	13⅓	57	62·7
Ghee ...	16	67·5	74·25
Sessamum oil ...	13⅓	57	62·7
Salt ...	2	8·25	* 9·075

* I have adopted the scale of maunds and jitals and dams as given by that most careful writer, E. Thomas, the author of the Chronicles of the Pattan Kings of Delhi. I have as yet seen no other author who has discussed the values of the various coins of Mussalman Kings of Delhi in that impartial and searching spirit as Mr. E. Thomas has done. If, however, his calculations can be shown to be incorrect, my conclusions would *afortiori*, become incorrect too. I would, therefore, request my readers to bear this important point in mind and if possible, they should make independent enquiries in the valuation of ancient coins.

It will be seen from the preceding table that the eleven commodities named above were awfully cheap when compared with the present times. It is very likely that the reader would be highly suspicious of the correctness of the figures. But there would be no ground for suspicion when the prices of the same articles are observed in Ayen Akbari, the most reliable history of the times of Akbar the Great. Broadly speaking, there is a perfect blank in the economic history of India from 1310 to 1560, for a period of two centuries and a half. It is only in the time of Ferozshah (1351-1381) that India enjoyed even the name of peace and prosperity. Although there is one special history, by name Ferozshah, of that period, yet we do not meet with any quotations of prices. I have come across quotations of five commodities only, but the last two do not seen reliable to me.

Reduced to modern maund and money, the prices of the five articles are as below :—

Wheat 34·16 pice Ghee 427·08 pice.
Barley 17·08 „ Fine sugar 471·5 „
Gram 17·08 „

TABLE II.

Prices in the time of Akbar.

Articles.	Price per maund of 55 5 lbs. av. in *Dams* (From Ayen Akbari.)	Reduced to modern maund. of 82 lbs. in annas.	Modern prices per maund. Whole-sale prices in Nov. 1912.	Modern prices per maund. Retail prices in Sep. 1913.		Rise of prices. During 300 years per cent
1	2	3	4	5		6
			Rs.	Rs.	A.	
Wheat ...	12	10·5 annas or pence.	3·193	3	1	466 6
Flour ...	15–22	13	...	3	13	469·2
Barley ...	8	7	2·687	2	12	628·5
Millet ...	6	5·3	2·354	3	0	905·6
Peas ...	6	5·3	...	3	8	1056·6
Rice ...	8	7·57	5 057	4	6	924·7
Mong ...	18	15·75	...	5	0	507 9
Pulse ...	16	14·25	...	4	4	477·1
Gram ...	16½	14·70	2·104	2	12	299·3
Moth ...	12	10·5	...	4	8	685·7
Jwar ...	10	9	2·161	2	4	400
Fine sugar...	128	98	...	12	0	195 9
Raw sugar.	56	49	4·536	4	0	130·6
Ghee ...	105	98	48·891	54	0	881 6
Sessamum oil	80	70	...	16	0	865·7
	...	...	...	...		559·73

Comparing column 4 of table I with column 3 of table II we find that the average prices of ten articles of utmost necessity in India rose to nearly three times after the lapse of some three centuries but they have again risen to $5\frac{1}{2}$ times from 1600 to 1912 A. D. It would also be useful to know the real standard of comfort enjoyed by wage-earners in India during the reign of Akbar and the second decade of the 20th century.

MONEY WAGES IN THE TIME OF AKBAR.

Bricklayers ...	... 7,6,5,4 dams. *per diem*
Carpenters ...	... 7,6,4,3,2 ,,
Bildars (Pioneers)	... $3\frac{1}{2}$, 3 ,,
Divers in Wells...	... 4,3 ,,
Thachers ...	... 3 ,,
Water carriers ...	... 3,2 ,,
Labourers (who carry earth, water, etc., for buildings).	2 ,,

It is now clear that an ordinary unskilled labourer of the lowest grade could *get for his daily wages of 2 dams only, any one of these things in the following quantities :—*

TABLE III.

Real wages per diem in the time of Akbar.

Wheat	... $9\frac{1}{4}$ lbs.
Barley	...$12\frac{3}{8}$,,
Rice	...$12\frac{3}{8}$,,
Mung	... $6\frac{3}{18}$,,
Mash	... 7 ,,
Gram	... 7 ,,
Moth	... $9\frac{1}{4}$,,
Millet	...$18\frac{1}{2}$,,
Peas	...$18\frac{1}{2}$,,
Jwar	...$11\frac{1}{2}$,,
Raw sugar ...	... 2 ,,
Ghee	... $1\frac{6}{105}$,,
Sessamum oil ...	... $1\frac{31}{80}$,,
Salt	... 7 ,,
Mutton	... $1\frac{46}{65}$,,
Goat's meat ...	... 2 ,,
Milk	... $4\frac{1}{4}$,,

But to-day a labourer of the same grade can get the following quantities in *Kankhal* (Hardwar) for his daily wages of 4 *annas.*—indeed, a liberal wage for an unskilled labourer in the United Provinces of Oudh and Agra. It is known to all that in these days of railway, telegraph and daily newspapers, prices of principal commodities are very nearly the same all over the country. Hence, labourers in the Punjab and the United Provinces cannot be better off than their compeers of Khankhal, Hardwar.[1]

TABLE IV.

Real daily wages in any one of the commodities in the time of Lord Hardinge.

Wheat	... $6\frac{1}{2}$ lbs.
Barley	... 9 ,,
Rice	... 5 ,,
Mung	... 4 ,,
Mash	... 4 ,,
Gram	... 7 ,,
Moth	... 4 ,,
Peas	... 4 ,,
Jwar	... $5\frac{1}{2}$,,
Millet	... 7 ,,
Raw sugar ...	... 4 ,,
Ghee	... $\frac{3}{8}$,,
Oil	... $1\frac{1}{4}$,,
Salt	... 8 ,,
Mutton	... 2 ,,
Meat	... 2 ,,
Milk	... 4 ,,

COMPARISON OF THE TIMES OF AKBAR AND LORD HARDINGE.

If we strike a simple arithmetical average, we find that, in the time of Akbar, an unskilled labourer could, on the average, get seven pounds of the seventeen commodities as his daily wages but to-day after the lapse of more than 3 centuries, during which the Western world has made wonderful strides, an unskilled labourer

1 "In months in which there is no abnormal demand for labour, agricultural labourers are now paid from 2 to 3 annas per day in Gurgaon, 3 annas in Delhi and Kangna and $3\frac{1}{2}$ annas in Rohtak. These are the only districts under 4 annas. The daily wage still approximates to 3-anna rate (in the Delhi Division) which is paid in the neighbouring districts of the United Provinces. A 4-anna rate is reported in the Salt Range and in Multan, Muzaffargarh, D. Ghazi Khan, Karnal and Ambala." There are again 3 districts with 5-anna rate, some districts of the Central Punjab with 6-anna and 8 anna rates. Thus, the average wage for the whole of the Punjab of an unskilled labourer is 4 annas per day, Punjab Census Report 1911, Part I,

can obtain only $4\frac{10}{17}$ lbs. of the same articles. Such is the condition of an Indian labourer under the most civilized Government and the best opportunities of improvement! But let us for a moment turn our attention to really progressive countries. Mr. Mulhull in his Dictionary of Statistics gives a very interesting table of the progress of wages from the 15th century in the United Kingdom. We quote below one part of it which deals with the purchasing value of the wages of shepherds, labourers, women and boys at various periods, so that we may compare the progress of wages in the United Kingdom with the increase of real wages in India :–

Year.	Shepherds.			Labourers.			Women.			Boys.		
	£	s.	d.	£	s.	d.	£	s.	d.	£	s.	d.
1400 ...	5	18	0	4	8	0	3	0	0	2	4	0
1450 ...	6	10	0	5	5	0	4	0	0	2	10	0
1500 ...	7	16	0	6	0	0	4	4	0	3	0	0
1550 ...	8	0	0	7	0	0	4	4	0	3	4	0
1600 ...	6	0	0	5	5	0	3	6	0	3	0	0
1650 ...	8	0	0	5	4	0	3	8	0	2	10	0
1700 ..	10	10	0	8	8	0	6	6	0	5	4	0
1750 ...	10	0	0	8	15	0	6	6	0	4	15	0
1800 ...	16	16	0	12	12	0	8	8	0	6	6	0
1850 ...	25	0	0	20	0	0	10	0	0	8	0	0
1880 ...	36	0	0	30	0	0	15	0	0	10	0	0

From the foregoing table it is clear that up to the year 1880, the real wages of all workers in the United Kingdom had risen six fold when compared with the year 1400 and a little more than five-fold when compared with the year 1600. That is, while in one country from the time of Elizabeth (contemporary of Akbar) the inhabitants have been constantly progressing in material prosperity *so that their real incomes have increased five times*, in India the advance of evolution has been reversed or at the utmost, checked by some unseen forces because unskilled labourers are to-day earning, *on the average*, $4\frac{10}{17}$ *lbs. of the 17 articles of utmost necessity while their ancestors of their time of Akbar the Great could earn* 7 *lbs.* per diem.[1]

It is often said that India is a conservative country with set, crystallized and hide-bound institutions which defy the ravages of time and change. Such a saying is only too true but its real worth is also fully realized by instances such as those given above.

One more aspect of the preceding table requires special attention. Even in free and progressive England wages were only doubled during the three centuries and a half from 1400 to 1750, that is, before the introduction of machinery in manufactures. Since the start of the Industrial Revolution, however, wages began to increase by leaps and bounds, so that during 130 years only they rose to six times as much as they were in 1400. From 1850 to 1900 the average real wages have doubled, while during the last twelve years they have increased by 10 per cent. more. It is obvious that the condition of the fortunate inhabitants of the United Kingdom is incomparably far better than that of their forefathers of the time of Elizabeth. But it is a wonder of wonders that the masses of India have not only not improved but have positively deteriorated in material conditions! The causes of such a reversion and stagnation are not far to seek. It is a pity that the majority of Indians are mere masses of ignorance, stupidity, inactivity, envy and prejudice. The most desirable qualities of activity, courage, enterprise, originality, industry, prudence and perseverance are mainly absent from their heads and hearts. Their false contentment with present surroundings has thoroughly killed the spirit of secular advancement and perhaps with no hopes and prospects of public offices, and honours and distinctions, they have lost all laudable ambition and have degenerated into an indolent, unaspiring and unambitious nation. When the rest of the world has made

1 We have ignored differences of quality that might exist between the articles available during the time of Akbar and the present day. Moreover, hours of labour have been supposed to be the same in both the periods. But we are amply justified in so doing. India during the time of Akbar was not backward as regards agriculture because the Indian agriculturists of to-day have not adopted agricultural machinery, better manures or some better seeds of wheat, gram, barley, rice and other principal crops in question. *There could, therefore, be no differences in quality. As regards the hours of labour, variations would be still less obvious* in the kind of unskilled labour that we have taken: farm-labour and lowest labour of carrying brick, earth and water in the building trade.

wonderful progress in improving its lot, the masses of India have been and are still quietly sleeping in the lap of deadening contentment. It is yet time to escape from the perilous debasement of a whole people. If Indians should rise, awake and follow the path of Vedic optimism and the ways of material and secular progress so very liberally shown by the Western people, they may yet better their pitiful condition. A people with the ambition, enterprise, perseverance & freedom of the West, possessing such a wealth of natural resources, would have made this land a veritable paradise. But now in the absence of native genius and owing to overgrowth of indolence and false contentment, all the unbounded resources are being constantly and rapidly depleted to enrich the West.

Then it cannot be ignored that civilized governments can do an immense work for the amelioration of their subjects. They are centres of various motive powers of the communities; these can either be carelessly and ruthlessly wasted or sympathetically and carefully utilized for the advancement of the people. Mr. J. S. Mill has truly said, "A community can *only* be developed out of one of these states into a higher by a concourse of influences, among the principal of which is the government of which they are subject. In all states of human improvement ever yet attained, the nature and degree of authority exercised over individuals, the distribution of power and the conditions of command and obedience, are the most powerful of the influences except their religious belief, which make them what they are and enable them to become what they can be." It would, indeed, hardly be an exaggeration to say that India too can rise with the active sympathy and liberal assistance of her government or fall into the sink of poverty and degradation for want of active sympathy, interest and stimulus of the same. The hoary civilization of India deserves a sympathetic treatment, and moreover, we think India has still some mission to fulfil in the economy of future nations Let this ancient land—the famous cradle of humanity, art, science and religion attain some respectable position that it may be better enabled to fulfil that happy task !

AUDITORS AND THEIR DUTIES.

BY MR. NAYAN H. PANDIA. M.A., LL.B., *Solicitor*, *Bombay*.

Stock in trade, which constitutes a special heading in the *pro forma* Balance Sheet given in the Indian Companies Act is undoubtedly a most important item in the Company's assets and it is an auditor's duty to use all reasonable care and diligence to satisfy himself that it is correct. The Kingston Cotton case, which would be followed in India, lays down the principle that auditors are not stock-takers and that they are justified in relying upon the officers of the Company for information as to the stock, but even with this the onus lies on the auditor to prove that his reliance was reasonable and honest and he would have to justify his acceptance of the stock item as certified to him by the officers of the company.

Under these circumstances, the important question arises whether auditors cannot insist upon obtaining a certificate from the managing agents as to the value of the stock in trade at the end of each year or half-year for inclusion in the Company's Balance Sheet, before they report it to be correct, and whether in the absence of any such certificate, the auditors would not be justified in inserting at the foot of the Balance Sheet a clause to the following effect :—" Subject to the accuracy of the item 'stock in trade,' for which we have seen no satisfactory certificate."

It should be noted in the first instance that there is a difference of practice between an auditor's work in India and in England. In

England the auditors never attend personally to verify actual stocks or selections of the same, but accept the stock sheets prepared and certified by the Company's officials. Here, however, auditors do attend at some mills to verify actual stocks, but they do not, as a rule, certify stock sheets although of course they take reasonable steps to ascertain that the stock actually seen by them appears and no more appears in the fair stock sheets subsequently proposed. It is submitted therefore that auditors are entitled to contend that they go to the mills and see the stocks there as an extra service to the shareholders and that it is no part of their legal duty and that therefore they accept no legal responsibility for the stock, but that they are entitled to a certificate from the managing agents, and that their duty and responsibility do not legally go beyond their checking the figures, thus certified in the Balance Sheet.

It should however be remembered that section 132 of the Indian Companies Consolidation Act, 1913, requires that the Balance Sheet of a Company shall be in a certain form and section 145 enjoins upon the auditors the duty of making their report to the members stating whether the Balance Sheet exhibits a true and correct view of the state of the Company's affairs, and a qualified certificate or statement in the report such as that suggested might probably disentitle a Balance Sheet containing it or annexed to the report, to acceptance, seeing that such a qualification would be tantamount to a statement by the auditors that they were not prepared to certify the correctness of the account in a very important particular: it would certainly cast a considerable doubt upon an item which might be perfectly genuine and might in consequence cause considerable damage to the Company. On the other hand, there would appear to be no objection to qualifying the report by some such words as follows :—"Subject as to the item of stock in trade, the value of which is taken from the stock book of the Company certified (or not certified, as the case may be) as correct by the managing agents of the Company." The effect of this addition would not be to cast a doubt upon the genuineness of the value appearing in the stock item but it would be in effect declaratory of the extent and limitation of the duties undertaken by the auditors. According to the *pro forma* Balance Sheet given in the Act, the mode of valuation of the stock in trade, *e.g.*, cost or market value, has to be disclosed.

Whether or not a certificate is given by the managing agents, it is the auditor's duty to examine the stock books of the Company and if he entertains any doubts in regard thereto and any explanations asked for by him are not satisfactorily given, it is of course open to him to state that fact in his report, but there is a considerable difference between demanding a certificate of stock and asking for information and explanations on matters arising on the Company's books and accounts, and probably auditors cannot compel the delivery of a certificate of stock by the managing agents of a Company.

In adjudging the liability of auditors in respect of a false stock-taking, the test will be whether the auditors (in the light of the Kingston cotton case decision) in fact exercised the proper amount of care and vigilance, and in this view, one cannot think that the fact of the auditors attending the Company's premises to view the stock would necessarily tell against them, but on the contrary, it might be used as an argument in their favour to show that they had in fact exercised a greater amount of diligence than was exercised by the auditor in the Kingston cotton case, who never visited the mill premises at all. This is of course on the assumption that the particular auditors have not accepted the position of stock-takers and their functions. Generally, it is not amongst the proper functions of the auditor to take or value stock, but he is entitled to place a reasonable reliance in respect of the item upon the Company's responsible officers.

In the Bank of Burma case, the accused Directors were convicted on the grounds that unpaid interest on bad and doubtful debts had been dishonestly credited to Profit and Loss

Account and rendered divisible as profit and that the principal of these debts was treated as good in the Balance Sheet. The question really was whether the accused knew that the Balance Sheet was incorrect and misleading and that a dividend should not be paid? The jury held that the knowledge was proved and their verdict was upheld by the Chief Judge and the other Judges in appeal. It was admitted that the auditor had brought the facts to their notice. In his letter produced before the jury he had written to the Directors as follows :— "The kind of securities produced to us for a considerable number of the loans are not of such a nature as they could be realised if necessary; such as loans on the security of certificates of prospecting Companies, loans on the security of liens on the profits of speculative shares." etc., and he urged that a dividend be not paid from this. Under the circumstances there was no doubt that the real state of affairs was known to the Directors and that it was concealed from the public : thus the Balance Sheet was incorrect and misleading and a conviction was inevitable.

It may be interesting to note that the Judge's summing up to the jury contained the following remarks touching the auditor's certificate and the conduct of the auditor in regard there to.

With regard to the auditor it seemed to His Honor that (the auditor) ought to have mentioned in his report to the shareholders the doubts he felt about the securities and the advice he gave the Directors about the crediting of unsecured loans. The omission from the report of all reference to this matter was hardly justifiable. (The auditor's) action with regard to the audit and the Balance Sheet showed a degree of compliance towards the Directors and the manager which rendered it necessary to discount his evidence considerably but it was entirely for the jury to put their own construction on (the auditor's) action and form their own opinion of the value of his evidence." On this part of the summing up the jury unanimously expressed the opinion that the auditor by certifying the Balance Sheet in question as showing the true position of the Bank, grievously failed in his duty and was deserving of the greatest censure.

CELLULOID OR IMITATION IVORY.

BY M. N. GHOSH M.C.E., M.R.A.S.

Celluloid or in other words, Imitation Ivory is made of nitro-cellulose. Of the various kinds of cellulose, cotton is most extensively used in the manufacture of celluloid.

The cotton is first of all chemically purified in a soda bath in order to remove the fats, oils and other impurities and then it is turned into nitro-cellulose, technically called 'pyroxyline' by treating it in a mixture of $H^2 SO^4$ and HNO^3 acids of varying proportions. The duration of nitration depends on the temperature and specific gravities of the acids used. It may be completed from 15 minutes to a few hours. This process of nitration requires special care and attention, for the whole may burn away in a moment at the time of stirring the nitro-cellulose in the acid solution.

The nitro-cellulose or pyroxyline is then washed in a stream water. When all the traces of acids are removed, the pyroxyline is dried in the sun or in a drying machine as the case may be. At this stage, it should be carefully stored in a safe place, for it catches fire very easily and burns away without leaving any residue. In this connection, I should tell the reader that it is quite a different thing from gun-cotton. But there is a popular belief that celluloid is made of gun-cotton. This is a mistaken idea, inasmuch as butter and curd are not the same thing, although they are both products of milk. Pyroxyline differs from gun-cotton principally in its being non-explosive.

Now, this pyroxyline is dissolved in a solution of camphor and alcohol, which turns the whole mass into a plastic body. This latter is known as celluloid. It may be coloured as desired. Steam pressure is required to form the mass into sheets, from which combs and many other useful articles are being now manufactured.

Of the many useful articles made of celluloid, mention may be made of combs, buttons, printing plates, handles of umbrella, stick, cycles, soap-boxes, etc.

Celluloid may be used to advantage, as a substitute for ivory, horn and malachite. The advantages of the former over the latter are (1) celluloid being a plastic body any desired shape can be given to it by means of moulds ; (2) celluloid articles are cheaper in prices, and (3) they look very decent and do not easily break.

The Agricultural World.

Farming by Dynamite.

From experiments conducted at Lausanne recently on the use of dynamite for soil tillage, it was found that trees planted in soil prepared by dynamite develop more rapidly and come into bearing earlier than those planted in the usual manner. It was also found that dynamite might be advantageously used for preparing land for plants possessing deep roots, especially when the subsoil is hard and compact.

Milking Three Times a Day.

Mr. M. A. O'Callaghan writing in the *Agricultural Gazette* of Tasmania says that experience has shown that cows that give very large quantities of milk will yield more milk if milked three times in the 24 hours instead of twice. If a cow is a large maker of milk, her udder becomes full long before milking time arrives unless she has great capacity in her mammary glands, and hence the animal suffers a certain amount of pain if allowed to go too long without being milked. Under such circumstances, a cow will give larger yields if milked three times a day, and the butter fat test will not suffer. In nearly all the American records, the cows that produce such high yields are milked three times a day.

Agricultural Implement Depot.

The Government of Mysore has sanctioned the continuance of the agricultural implement depot for a further period of ten years. The depot has been the means of extending the use of improved agricultural implements to a considerable extent, implements of the value of over Rs 18,000 consisting mostly of ploughs and spare parts of ploughs having been sold during the three years it has been open. The Government has also suggested that arrangements might be made at more than one centre for the local fitting up of ploughs and other implements for which there is most demand, the iron and steel parts being obtained wholesale from Amercia.

It is inclined to believe that the usefulness of the depot can be greatly enhanced and the introduction of improved implements rapidly pushed, if, with the collaboration of the Revenue Department and the Agricultural Department, takavi loans are granted with as little delay as possible to raiyats who wish to purchase such implements.

Forcing Early Fruiting.

In an article on the "Annonaceous Possibilities for the Plant Breeder" appearing in the July number of the *Philippine Agricultural Review*, Mr. P. J. Webster refers to a method adopted by him since 1904 to force seedling plants into early fruiting. It is applicable to practically all fruits and is extremely simple. Stock plants of vigorous species are reared and set out in their permanent positions in the test orchard awaiting their "charges," as it were. The seedlings of new introductions are planted out close to the large stocks, as soon as they are sturdy enough to be set out in the open, and, when established, they are inarched upon the larger plant. After the union is well formed, the top of the stock is gradually removed and with the vigorous and well-established root system of the older plant, the little seedling is forced into fruiting far earlier than if it had been set out and sustained by its own root system only.

A New Disease of Rice.

A new disease which affects our rice has been discovered which, according to the *Agricultural Journal of India*, has been ravaging the paddy crop in a part of Bengal. The symptoms of Ufra, as the disease is called, are characteristic. At about the fourth or fifth month of growth, the tips of the rice leaves are found to be withering, and the young shoots are pale and flaccid. When the plants

come to ear, many are found with the top of the shoot swollen into a spindle, consisting of the immature ear, enclosed in its sheath. In other cases, however, the ear escapes wholly or in part from the sheath, but the lower grains fail to develop, and the upper are usually shrivelled. On removing these sheaths the stalk is found blackened and shrunken for an inch or so, just above the upper stem joints, especially the joint which carries the ear and that next below. The cause of Ufra has been determined to be a minute worm, belonging to the nematode class. The best method of fighting the disease has not been determined on.

The War Against Field Mice in France.

Jacques Boyer writing on the above subject in the *Scientific American* details the ravages done by field-mice and similar rodents during times of cultivation, and the means adopted to combat these pests. These appear suddenly in immense numbers and vanish as mysteriously, leaving behind them lamentable records of their visit. The average annual loss caused by them in France is estimated at forty million dollars. Commissions were appointed at various times to find out the causes of the onslaughts of these destructive animals and successfully devise means of combating them. It has been found that the suddenness of appearance and disappearance is due not to any migratory habits of these animals but to their extraordinary fecundity, which is increased by the numerical preponderance of females. It has been calculated that one pair of adults may produce between February and the end of autumn a progeny of 200 females and 100 males. Hence a rodent population of 150 existing in about $2\frac{1}{2}$ acres of land in February may increase to 10,000 in July and to 20,000 in September by their normal multiplication.

As regards checking these pests, frost and winter have a destructive influence over them. They are also hunted and destroyed by birds of prey. And they die owing to their own enormous numbers and consequent lack of food.

At first, poisoning with arsenic was recommended. A mixture of arsenic and flour is stirred into a quantity of wheat moistened with molasses, and the poisoned grain is placed in drain tiles of small calibre which are distributed through the infested fields. Some writers advise placing the poisoned grain in the rodents' burrows and stopping the entrances with earth. This method yields imperfect and uncertain results, for the rodents often refuse to eat the poisoned grain. Arsenic, moreover, is intensely poisonous to all animals and to human beings.

It is better, therefore, to use the barium carbonate bread invented by Dr. Hitner of Munich. Four parts of cheap flour and one part of barium carbonate are mixed with water and yeast. The dough is allowed to rise and is baked in compact hard loaves about $1\frac{1}{4}$ inches thick. The bread is soaked in skimmed milk or sprinkled with essence of aniseed and is broken into pieces as big as a hazelnut, one or two of which are put into each burrow. It is asserted that little more than one pound of bread to the acre is required to rid a field of rodent pests, so that this method is both cheap and effective.

Suffocation by carbon bisulphide vapour was tried afterwards. But now the most favourable method consists in infection with a contagious disease. In Germany Loeffler Virus is used ; and in France Danysz Virus has been adopted after many experiments. The Virus is prepared at the Pasteur Institute If the results are yet unsatisfactory we are recommended to use all the methods from arsenic down to the Virus treatment.

The Sterilisation of Seeds.

Numerous methods are in use for destroying the micro organisms which occur on or in the coats of seeds. The most general method consists in washing the seed with an antiseptic, such as corrosive sublimate. A new process, which appears to give yet more satisfactory results, is described by Messrs. Pinory and Magron in the *Bulletin de la Societe Botanique de France* (Vol. 59, 1912, page 609). This pro-

cess, which has been employed also by others, consists in immersing the seeds in commercial hydrogen peroxide. According to the observations of the authors cited, hydrogen-peroxide is efficacious in destroying micro-organisms and produces no harmful effect on the seeds, even though the latter be soaked in it for many hours. Messrs. Pinory and Magron state, moreover, that hydrogen peroxide exercises an accelerating influence on germination. Peas treated with the re-agent began to grow a day and-a-half before similar untreated seed, and seeds of *Orobus tuberosus*, treated previously with peroxide, germinated in 8 days—as against 28 days taken by untreated seed. These facts, if they prove to be generally true, are of considerable importance, not only from a scientific and theoretical point of view, but also from that of practice. To give but one illustration, the seeds of many grasses germinate with extreme slowness: if they could be made to germinate in the course of a few days, not only would time be gained but loss from birds and ground animals would be reduced.—*The Gardeners' Chronicle.*

Reasons for Draining.

The Journal of Agriculture, Victoria, explains why wet land should be drained. The chief object in draining wet land is not to remove the extra water. It is to admit fresh air and this can only be accomplished by getting the water out. Plant roots must breathe, and nitrification in soils needs fresh air, and in water logged soils these results can only be attained by first removing the water. As the result of several years' observations on the effect of drainage it is concluded that the most important factor concerned in the increased productivity of a soil from tile draining is the improvement in aeration. In order to increase the aerating effect, the tiles were sometimes connected with the upper air by placing vertical flues, but the results of this departure from ordinary practice are as yet inconclusive. The experiments are being continued. Probably the air drawn into the soil as the water soaks into drains in the usual way gives sufficient aeration in ordinary cases, and circumstances are conceivable which would even render the upright flues an impediment to aeration. The foul air or carbonic acid gas, produced in soils is itself heavier than air and subject to diffusion, and will slowly find its way down the drains when these are not carrying water. This flow of gases will be faster the greater the fall in the pipes, and particularly when the subsoil is much colder than the upper air. But the most important action of drains is to promote aeration by first taking the water out.

Influencing the Composition of Seed.

All grain is composed of three classes of chemical compounds, fats or oils, proteins. and carbohydrates (carbohydrates are sugars and starches). The oils, fats, sugars and starches supply heat and muscular energy to the body. The proteins build up the muscles and nervous tissue, and all mental processes are concerned directly with the breaking down of protein in some form. Proteins are the building materials of muscles and tissues, and the fuel of the brain and nerves, just as fats and carbohydrates are the materials for heat supply to the body. Any grain, therefore, which can be produced which will contain larger percentages of proteins than the existing varieties will serve two purposes. It will have a larger muscle-building value and nerve value, and its heating properties will be reduced.

Some pioneer work in this direction has already been done by chemists. For example, at the Government Agricultural Experiment Station in the University of Illinois, there has been developed four distinct "strains" of corn, all from the same original seed. The first strain has forty per cent more protein than the original grain. The second strain has twenty-five per cent. less protein than the original. The third strain contains sixty-five per cent. more oil than the parent corn, and the fourth contains fifty-five per cent. less oil. These changes have been accomplished by ten years of selection based upon chemical analysis.

Fecundity in Fowls.

The results of Dr. Raymond Pearl's remarkable investigations in respect of the laying capacity of fowls are given in the *Journal of the Board of Agriculture* for June 1913.

It appears that the principal agent in transmitting fecundity (laying capacity) in fowls is the male bird, and that selection of cocks must be practised, as well as selection of hens, in building up the desired strains of high fecundity fowls.

In the investigation, winter egg-production was adopted as a measure of fecundity because the capacity of strains varies most during this period. It was found that hens can be placed in three distinct classes: (*a*) those laying no eggs whatever during the winter period, (*b*) those laying under thirty eggs, and (*c*) those laying over thirty eggs.

Independent of any mendelian theory or phraseology which may be framed to account for his observations, Dr. Pearl actually found that hens of high productivity were unable when mated with certain cocks to transmit their qualities to their daughters. On the other hand, he discovered that hens of the thirty and over class, if mated with certain other cocks, gave sometimes all highly productive daughters, and, sometimes, partly high producers and partly low producers. Again, he found that if certain cocks were mated with hens of zero, or low producing capacity, all the daughters produced thirty eggs and over.

As a guide to the practical application of these results, the writer of the article in question says :—

"The main desideratum is to produce the cock which invariably gets daughters of high fecundity ; to do so, the high fecundity hen must be found by selection ; she will transmit her desirable character through her sons, but only in certain cases will all these sons be of the highest quality. If all are of the highest quality (that is, invariably getting high fecundity daughters, however mated), then their *father* is the male wanted. But if, as is more likely, the sons differ, each must be tested by mating, with a view to ascertaining what his quality is. This testing should be done, preferably, *with zero hens*, for if the male is not of the highest class he will, when mated with such hens, get daughters of low fecundity."

Locust Poison.

Amongst the various methods of combating locusts, the latest is that of an arsenical preparation which consists in spraying the hoppers, either when they are hatched or when they are already on the march, with a solution of arsenate of copper in water. To this solution is added a quantity, more or less, of molasses and sugar.

The insecticide instantly kills all the insects it touches, but even those which have not been reached directly die by devouring either the infected grass or the bodies of poisoned hoppers.

The insecticide used in Africa is prepared under Government supervision and supplied in special iron drums, containing 26·814 lb., branded "Locust Poison." Each drum contains 5 lb. arsenate of soda (69 per cent.), 1 gallon of molasses, and 10 lb. of brown sugar.

To prepare this poison, 200 lb. of arsenate of soda are dissolved in 15 gallons of boiling water, which is made up to 20 gallons with cold water.

Into each drum half a gallon of this solution is poured, to which is added 1 gallon of molasses and the whole thoroughly stirred. This constitutes the "Prepared Locust Poison."

In a circular (1st September, 1909), the Department of Agriculture of the Transvaal recommends the following:—

(*a*) For insects under two weeks old—

"Prepared Locust Poison"	1 part.
Water	60 parts.

(*b*) For older insects—

"Prepared Locust Poision"	1 part.
Water	50 parts.

Four workmen can prepare 200 drums per day. The cost of one drum is 1s. 2½d.

The price of the ingredients works out thus—

		s.	d.
Drum	... ...	1	$0\frac{1}{2}$
Molasses	... ...	0	7
Arsenate of soda	...	1	$0\frac{1}{2}$
Labour	... ...	0	1
Sundries	.. ...	0	2
		2	11

The solution is sprayed as lightly as possible on the vegetation surrounding a sleeping swarm or over a portion of land several yards square in advance of a swarm on the march; thorough wetting of the grass or insects is to be avoided. The hoppers are attracted by the sweetened liquid, and are generally destroyed in a few hours. The experiments made by the Locust Bureau have shown that, by taking some precautions, there cannot be any danger to cattle in the infected zones by the use of the insecticide. Some precautions are also needed to prevent the irritation of the skin caused by the manipulation of the insecticide. This has been obviated by the preparations being supplied in hermetically sealed cases, already prepared, and which may be at once emptied into the water, and also by the use of implements similar to the pumps used for sulphuring grape vines.

Secret of Silo Preservation.

The success achieved by Mr. Albert Norton in rendering the thorny cactus suitable for feeding cattle promises to give a new source of fodder-supply in famine years. We refer our readers to page 384 in the June number of the *Wealth of India* where a similar use of the thorny cactus is mentioned. An advance of a different nature is set forth in a pamphlet by Sam Higginbottam, M.A., B.S.C., Superintendent of the Agricultural Department of the Ewing Christian College, Allahabad, in which he shows how ordinary fodder may be preserved and improved. The title of the pamphlet is "*The Silo and Silage.*" While giving the result of highly scientific investigations, the information afforded is of general interest. It is explained that the principle of the Silo is that of a jam jar. It is a hole in the ground not less than ten feet across and sixteen feet deep, having walls, smooth, air-tight and moisture proof. It may also be built above ground. The Silage is any succulent forest crop preserved in a Silo in a moist palatable state which can be used as a green food for cattle all the year. It is said to be superior to pasturage.

Various crops are used for this purpose, but maize, juar and bajri are the best, because of the sugar in their stalks, the large amount of nutriment contained and the great tonnage per acre. Almost any cultivated or jungle grass, oats, barley, wheat, peas, lucerne, crushed sugar-cane, sugar-cane tops, weeds such as thistles, that otherwise cattle will not eat, can be converted in the Silo into nutritious food. The initiated might think that such material, even when cut into half-inch lengths and trampled down and well watered if too dry, would soon be fit for nothing, whereas it is declared that only a few inches at the top go bad, and that this portion forms a crust and protects that below, keeping it perfectly good for several years. Thus advantage can be taken of a year of plenty when fodder is cheap for storing the food against a time of scarcity. Those who are practically concerned with the subject should obtain the pamphlet.

The secret of preservation in a Silo lies with three agents, *viz.*, oxygen, the most important factor; bacteria, the next; and enzymes, or unorganised ferments, whose importance is undetermined. First, as regards oxygen, which plant-cells require. The compression of the fodder in the Silo excludes the oxygen of the air from the cells, which then take the oxygen from the compounds which they contain until this source is used up, when the cells die. This process of oxidation causes heat and liberates quantities of carbon dioxide gas which permeates the silage, preventing further decomposition. Secondly, as to bacteria, which are located in the juice of the plants themselves as soon as cut. These if not killed would decompose the silage and render it unfit for use; but they are killed by the temperature resulting from the compression of the

silage and by the acids of the silage. The fermentation that takes place is the conversion of a part of the sugar into lactic acid, of the remaining sugar into alcohol, and of the alcohol into acetic acid. This complex process is likened to the ripening of cheese, softening the fibres, making the muscle-building elements more digestible and adding new and agreeable flavours. Silage cannot be transported over distances that involve journeys of more than twenty-four hours, so cattle and Silo should be near together.

Bone Manures.

In an agricultural country like India, it is cruel indifference that so many of the manurial substances should be negligently wasted or allowed to be shipped abroad. Putting aside the careless storing of cattle dung, and the export of oil seeds, the waste of bones in India and their shipment abroad is appalling. As pointed out by a correspondent in the *Farm and Home*, bones were the earliest of the phosphatic manures used elsewhere and were at one time very popular indeed. The various bone fertilisers are still largely used, of course, but they have suffered from the formidable rivalry of superphosphate and basic slag, which on many soils are quite as effective and at the same time cheaper. Bone meals are used in large quantities by manufacturers of compound manures, as they form mixtures which can be relied upon to keep dry and in good condition. Bone manures suit also those peaty soils that are of an acid nature.

The principle bone fertilisers are bone meal, steamed bone flour, dissolved bone, and bone compound, which we will consider in order.

BONE MEAL.

This is the best-known bone manure. It consists of the raw bones, after the mere extraction of fat, ground into meal. Various degrees of fineness are to be had, from the $\frac{1}{2}$-in. and $\frac{1}{4}$-in. used by gardeners for fruit trees down to more or less fine meals. It may be said at once that nothing but fine bone meal should be used, as even this is quite slow enough in becoming available. Generally speaking, bone meal is a better manure for grass land than for arable.

Bone meal is both nitrogenous and phosphatic. A good sample should contain at least 3·30 per cent. nitrogen and 45 per cent phosphate of lime.

STEAMED BONE FLOUR.

To produce this manure, the raw bones are steamed under pressure to extract the cartilage before grinding. This removes all but a trace of the nitrogen, but this is really an advantage.

DISSOLVED BONES.

Pure dissolved or vitriolised bones consist of bone meal treated with sulphuric acid to render part of the phosphate soluble. A good sample contains at least 2·67 per cent. nitrogen, 12 per cent. soluble phosphate, and 16 per cent. insoluble phosphate. It is an excellent manure for soils not deficient in lime, but dear on account of over-valuation of the nitrogen. It is easy to prepare a mixture of ordinary mineral super-phosphate and sulphate of ammonia that will have the same percentage composition and be equally effective, whilst decidedly cheaper. Such a mixture would, moreover, be in better condition than the dissolved bones, as the latter are generally damp and sticky.

BONE COMPOUND.

When steamed bone flour is treated with acid, as above, the result is known as bone compound. It contains about 0·82 per cent. nitrogen, 20 per cent. soluble phosphate and 12 per cent. insoluble phosphate. It is thus practically an acid phosphatic manure in no way superior to ordinary mineral superphosphate, though dearer. But bone compounds and bone manures often contain admixtures of mineral superphosphate, dried blood, and shoddy, with the object of adding to the content of soluble phosphates and nitrogen. Many of these mixtures are excellent manures. They should always be purchased on the basis of analysis, as they vary widely.

Dry Farming.

The last romance of agriculture, "the most daring of its many triumphs," writes Dr.

William Macdonald in the *Nineteenth Century*, "is the conquest of the desert." Dr. Macdonald is an enthusiast on the subject of "dry farming," in which he has carried out experimental work for the Union Department of Agriculture at the South African Dry-Land Station at Lichtenburg in the Transvaal It is no new system. In fact Dr. Macdonald claims for it an antiquity dating back to the dawn of civilisation, in Mesopotamia, Egypt, and North-Western India. Dry-farming aims at making the most of a scanty rainfall by conserving the moisture in the soil through a special system of tillage. The success achieved at Lichtenburg is ascribed by Dr. Macdonald mainly to the use of moisture saving fallows, in which the rain is stored up in the soil for the use of subsequent crops. The fallow land is deeply ploughed, and is then kept constantly tilled to prevent the formation of a soil crust which would permit the moisture to evaporate. It is claimed that this treatment results in four things—storage of rainfall; destruction of weeds which are moisture-robbers; admission of sunshine and air; and encouragement of beneficial soil-germs. What is called "soil-mulch" is defined as "any material which is spread upon the soil to shade the surface from the sun and to break the connection between the water-bearing sub-soil and the exposed surface." For example, a board or a stone lying on the ground preserves the moisture in the soil underneath. In the garden, leaves, straw, and manure are commonly used. But the most practical "mulch," Dr. Macdonald says, is made of loose, dry soil, and this is obtained by frequently stirring the surface of the ploughed lands with a harrow or cultivator. As to the thickness of this "mulch," or "soil-blanket", Dr. Macdonald says, it depends on the state of the weather, the soil, and the crop. In orchard cultivation, during a severe drought, the soil blanket is often made six inches deep or even more; but for cereals, which are surface-feeders, it should seldom be thicker than from two to three inches. In sowing, the seed must be drilled into the moist seed bed below the dry blanket. It is claimed amongst other things, that by this system of tillage the soil seed-bed can be kept moist for a whole year; that, so far as moisture is concerned, a crop can be planted, in South Africa, at any season; and that drilling gives better results than broad-casting. The durum or "macaroni" wheats are said to have yielded the best returns, and it is stated that crops have been grown without a drop of rain falling upon them from seed-time to harvest. The most important discovery in connection with dry-farming, according to Dr. Macdonald, is the value of durum wheat for poor soils and in regions of light rainfall. The hard durum wheats were at first received with little favour in America, but they are now being utilised with the aid of special mills and machinery. It was formerly supposed that these wheats were adapted solely to the making of macaroni, but Dr. Macdonald maintains their value in bread-making also. "The Alpha and Omega in the fight against drought," says Dr. Macdonald, "is the moisture-saving fallow." If the land should be exhausted of its vegetable matter, he argues that it can be restored to fertility by growing green legumes. In short, according to Dr. Macdonald, the dry-farming system, combined with the growth of the drought-resisting durum wheats, will make barren deserts fruitful, and safeguard the South African farmer against any failure of his scanty rainfall. Fortunately we are not threatened at present with drought in India, but it would be of interest to learn from agricultural experts how far the dry-farming system is applicable to this country.

Cotton Experiments in Bombay.

The following are extracts from the Report of the Deputy Director of Agriculture, Bombay Presidency, in 1911 12 :—

An important scheme for the organization of a market for improved strains of Broach cotton, grown by cultivators in the Surat District, was initiated in the year under report. As a result of a conference with the Bombay Chamber of Commerce, four of the leading

members of the Cotton Trade formed a Syndicate to perform the following functions on condition that the total quantity supplied should not fall short of the equivalent of 2,000 bales (400 lbs.) :—(1) To provide a buying agency on the spot ; (2) to purchase the seed-cotton certified by this Department at an excess rate amounting to 5 per cent. above current market rates for ordinary Deshi cotton ; and (3) to gin the seed-cotton separately from all other lots and return the seed to the Agricultural Department for redistribution.

The Department accordingly distributed over 60 tons of seed and provided a large reserve to meet the contingency of second sowings being necessary if the season proved adverse and it was estimated that an area of 11,450 acres was sown with this seed. Unfortunately, owing to a combination of unfavourable conditions, such as drought and the absence of dew at the time the bolls were bursting, the total crop of seed cotton produced was equivalent to only 1,167 bales, but the Syndicate did not raise any objection.

As is natural in the first season's working of a new scheme, involving several departures from local customs, a number of hitches arose, which may be briefly summarised as follows:—(1) The cultivators, being doubtful whether our cotton would yield as well as Deshi, were not, in all cases, desirous of buying our seed. (2) The local petty traders became alarmed that their business was being taken away and, by spreading false reports, put many prejudices into the minds of cultivators against accepting our seed. (3) The cultivators complained of the long distance they had to cart the seed-cotton to the Syndicate's gins at Rander and Bardoli. (4) The prices at first quoted at the buying agency were not really 5 per cent. above market rates, a point which the Syndicate took steps to rectify. (5) In the early part of the season, cultivators could not get advances from the Syndicate's agent at Rander. (6) Competition for the produce by local dealers who, in order not to lose seed-cotton, offered higher prices. (7) Some cultivators brought in inferior seed-cotton. (8) The usual facilities given to cultivators at the gins, *e.g.*, arrangements for food and lodging were not provided by the Syndicate at Rander. (9) There was some difficulty in getting the ginneries satisfactorily cleaned and all extraneous seed removed before the seed-cotton was ginned.

Eventually all these difficulties were surmounted and the scheme, as a whole, worked very well. The Syndicate appeared to be well satisfied with the cotton, though, owing to fluctuations in the world's market, which caused a disturbance in the relative prices of American and East Indian cottons, they say they incurred a small loss.

Although the improvement claimed for these cottons over Deshi is their superior quality of fibre, nevertheless they have given very satisfactory ginning outturns, as may be judged from the following comparative statement, a fact which must have been appreciated by the Syndicate :—

Name of variety of Cotton.	Number of maunds † of seed-cotton required to yield one—800 lbs. khandy (really 798 lbs.) of cotton.		Ginning percentage equivalents.	
	Rander gin.	Bardoli gin.	Rander gin	Bardoli gin.
Deshi ..	65½‡	67·75	32‡	31
Improved cotton	64	65	32·8	32·8

The average rates inclusive of the excess of 5 per cent. paid for the seed-cotton were—

Rander gin Rs. 131-14-7 per bhar of 924 lbs.

Bardoli gin Rs. 132-0-0 do.

and the cultivators were well satisfied with the promptitude with which payments were made as well as with the accuracy of the weighments at the ginneries.

It has been arranged with the Syndicate to extend operation in 1912-13 when it is hoped that 15,000 acres will be sown with seed supplied by this Department. This will be sown in four groups of villages in each of which the Syndicate will provide a ginnery and thus one of the chief difficulties with cultivators—*viz.*, long lead—will be easily done away with.

† One maund = 38 lbs. and one khandy = 21 maunds.

‡ These figures were obtained from native local merchants and should be taken with caution.

The Co-operative World.

Co-operative Credit for Farmers.

Farmers in the North-west of America are much in the same plight as the Indian ryots in the matter of obtaining loans at fairly reasonable interest. There too, the bankers prey upon their slender resources and stand in the way of the farmers obtaining cheaper credit.

As to the remedy for the present plight of the borrowers, Mr. Jacobstein, an American, holds that it is to be found in the establishment of co-operative credit associations by the farmer. He says :—

The great demand for capital in a new and developing country, the inability to attract sufficient outside capital because of the risky character of investment, the irresponsible character of some elements in the population, the character of farming methods, the commission agent, and the legal restriction handicapping banks—allowing for all these conditions, and because of some of them, it is believed that the farmers by organizing co-operative credit associations could reduce the rate of interest on both long and short time loans, and, furthermore, that such co-operative credit facilities would be a means of improving the methods of farming, would encourage stability in population, and would make the farmer feel that he is not being discriminated against in the borrowing and employment of capital.

It remains to be seen whether the farmers will make the experiment. The report of the the American Agricultural commission is bound to result in some tangible benefit to the American farmers.

Co-operation in Bombay.

Some striking features in the progress of co-operation in Bombay in 1912-13 are the increase of mill hand societies, a feature of great promise, and the establishment of the B. B. and C. I. Railway Employees' Society, an interesting development, the example of which is apparently being followed by the G. I. P. Railway. There is undoubtedly ample scope for such societies in large industrial centres. As in Madras, the Government of Bombay take particular interest in the development of the weaving industry and are gratified to observe the increase of nine in the number of weavers' societies during the year. The spread of the co operative spirit among the weaving community is of vital importance to the home industry. Without co-operation, the weavers cannot free themselves from bondage to the sahukar and obtain the capital required for the adoption of the improvements, on the development of which Government are spending considerable sums. The difficulties in the way of establishing a central yarn store are obvious, and the Government await the Registrar's proposals regarding the appointment of a central broker at Bombay for the purchase of yarn. The seed societies and grain-banks which have been established, though not numerous, appear to be working on sound lines and the progress so far achieved affords room for anticipating a further increase in the number of such societies in the near future. The establishment of reserve funds of grain by certain societies, the generous grant by the Wadia Trustees towards the establishment of a famine reserve fund and the action of the Nagar Central Society and the Bombay Central Bank in supplying funds to societies in the Ahmednagar District during the famine which prevailed there, afford promising examples of the manner in which the co-operative movement can be utilised as a means of protection against famine.

Co-operation in the United States.

An article on the above subject appears in a recent issue of the *Morning Post*.

Sir Horace Plunket's book on "The Rural

Life Problem of the United States" exercises great influence in American thought. To realise this, a comparison may be made between his summary of the functions of the Country life Institute and the terms of reference issued to the American Commission on agricultural organisation in Europe which has been appointed.

Sir Horace wrote :—

I may mention a few typical questions on which useful light would be shed by the Institute's researches:—

1. The influence of co-operative methods.

(*a*) on the productive and distributive efficiency of rural communities, and (*b*) on the development of a social country life.

2. The systems of rural education, both general and technical, in different countries, and the administrative and financial basis of each system.

3. The relation between agricultural economy and the cost of food.

4. The changes (*a*) in the standard and cost of living, and (*b*) in the economy, solvency, and stability of rural communities.

5. The economic inter-dependence of the agricultural producer and the urban consumer, and the extent and incidence of middle profits in the distribution of agricultural produce.

6. The action taken by different Governments to assist the development and secure the stability of the agricultural classes, and the possibilities and the dangers of such action, with special reference to the delimitation of the respective spheres of State aid and voluntary effort.

7. How far agricultural and rural employment can relieve the problems of city unemployment, and assist the work of social reclamation.

TERMS OF REFERENCE.

The terms of reference to the Commission are short but comprehensive, and their origin is unmistakable.

The inquiry will embrace an examination of the methods employed by progressive agricultural communities in production and marketing, and in the financing of both operations. Special note will be taken of

First—The parts played, respectively, in the promotion of agriculture by the Government and by voluntary organizations of the agricultural classes.

Second—The application of the co-operative system to agricultural production, distribution, and finance.

Third—The effect of co-operative organization upon social conditions in rural communities.

Fourth—The relation of the cost of living to the business organization of the food-producing classes.

Co-operation in Land Reclamation.

A co-operative society was founded recently at Louvain, Holland, for the purpose of carrying out works of clearing and improving the soil, whether for purposes of foresty, agriculture, horticulture, livestock improvement or pisciculture. In accordance with its rules, the Society proposes to attain its end by the following means :—

(*a*) placing itself at the disposal of those concerned (private persons or public administrations) for the study and carrying out of works of clearing the soil and of land reclamation, by means of the plantation of forests, establishment of pastures, etc.

(*b*) facilitating the relations between the small farmers and the proprietors, by renting, purchase or sale of uncultivated land or improved farms ; promoting or facilitating for small farmers the erection of buildings in the country ;

(*c*) letting out or hiring machinery, implements and other farm requisites ;

(*d*) engaging on its own account or for others in trade, in forestry, and agricultural produce ; occupying itself in the purchase, sale, selection and production of livestock, fish, seeds and plants ;

(*e*) carrying on credit and banking business to the advantage of the objects above referred to.

The society is constituted for a term of twenty years. Its capital will be formed by means of subscriptions of 50 francs.

From the net annual profits of the society, 3 per cent. will be deducted and placed in the reserve fund; $4\frac{1}{2}$ per cent. will be paid to members ; half the balance will be paid over to the members in proportion to the works carried out for them ; the other half will be placed to the special reserve fund, which by vote of the board of management may be used to encourage associations and kindred undertakings of public utility.

Organization of Milk Societies.

The problem of getting wholesome milk in sufficient quantities has become urgent and several towns are trying to solve the problem by Co-operative dairying. The experience of the societies established in the different parts of India is sure to be of interest to workers in this direction and it is for this reason we give below the text of the paper read by Mr. A. C. Chatterjee, I. C. S., Registrar of Co-operative Societies in the U. P., on the above subject. It was contributed to the recent Mysore Co-operative Conference.

In all large towns in the United Provinces, the question of milk supply has become very acute. It is not only that pure milk cannot be obtained, at prices within the means of the average citizen, but in many places it is impossible to obtain an adequate supply of milk of even moderately good quality. With a view to attack the problem by co-operative methods, the Visweswer Dairy Society was established at Benares by my predecessor Mr. Fremantle in June 1911. The Ahirs (or cow-keepers) of Paharia, a suburb of Benares, about four miles from the heart of the city have formed themselves into an ordinary unlimited liability credit society which is financed and supervised by the Kashi Co-operative Society (the Central Bank for the Benares District). This credit society lends money to its members for the purchase of cows and she-buffaloes, for buying fodder and for other needs. The same members have also formed themselves into a limited liability productive society (known as the dairy society), which has acquired land and built sheds, offices and outhouses in Paharia and also hired shops in different parts of the city for the sale of milk to the general public. The members are compelled to keep their cows (in milk) in the sheds, the fodder is inspected and passed and the milking is done in the presence of a responsible manager. The milk is transported in locked cans from the dairy to the shops in the city, where it is sold at eight seers a rupee. The members are paid ten seers a rupee and the margin is utilised for all expenses and also for paying a dividend and building up a reserve fund. The chief difficulty in this society has been the very heavy charges for transport. The sheds and land, etc., have also cost a large sum in capital account. The yearly payment of interest and of a portion of the principal of the loan is a heavy burden on the society. The business is likely to be much more profitable if it can be extended—and there is also a very great demand for the milk—but the society cannot afford to borrow further sums at present.

AN ALLAHABAD MODEL.

These difficulties have induced us to try a different form of milk society at Katra in the civil station of Allahabad. With generous help given by Mr. Fremantle, who is now Collector of the district, a combined credit and productive society (unlimited liability) has been organised among the Ahirs (cow-keepers) living in the hamlet of Bell close to the civil station. The building of sheds has been deferred, The members bring their cattle to a central enclosure in the immediate vicinity of the *bazaar* to be milked in the presence of a responsible official. The milk is then transported in locked cans to a shop close by and is sold for cash to customers. In this case it has been arranged that the cattle sheds at the homes of members and also the fodder given to the cows will be frequently inspected. The society started work in July last.

A LUCKNOW ATTEMPT.

An unlimited liability credit society has been in existence for sometime amongst the Ghosis (Mussalman cow-keepers) of Lucknow, civil station. The members have so far been al-

ways loyal to their society. In Lucknow, there is a large demand for cream and butter and also for milk, specially from dairies conducted on sanitary principles. In order to improve their business, the Ghosi society is now converting itself into a productive dairy society. Mr. Afforde, the Deputy Commissioner, has taken a great interest in the scheme. The society has secured a very good plot of *nazul* land on rent and is now building thereon sheds for cattle, quarters for the members, an office where also cream and butter will be manufactured and also quarters for a manager. The plans have been prepared with the assistance of the sanitary officers of the municipality. The society is being financed by the Lucknow Central Banking Union. The members are very keen; the site of the dairy is excellent and there will practically be no expenses for transpost. The demand for dairy produce in Lucknow, as I have said already, is very good. But the capital expenditure will be heavy, although the estimates are being kept down as low as possible. I hope the enterprsie will be successful.

WHERE, NOT FEASIBLE.

In some towns in the province it is not feasible to form co-operative societies of cow keepers because there are not enough men belonging to the trade. At Basti, which is a small town, the supply of milk is so inadequate that a number of consumers have formed a limited liability society and started a dairy. They have imported cows from other districts and sell the milk only to members. The supply from the dairy is so far unequal to the demand.

ALLAHABAD MODEL COMMENDED.

In a number of other towns, milk societies in one or other of the above models are at present under discussion. It is difficult yet to tell which particular form will be successful. From the small experience gained so far, I think that, in ordinary circumstances, it is desirable to start on the simple Allahabad model. It is true that from the sanitary and hygienic points of view, there are many objections to letting the cows to remain in the homes of the Members. But it is more important in my humble opinion to secure an adequate supply of moderately good milk at reasonable prices than to obtain a small quantity of absolutely pure milk at a cost much above what an ordinary citizen can afford. When society on the Allahabad model is well established and the cow-keepers have learnt the value and uses of organisation, it will be easy to take a further step and build sheds and purchase implements and machinery.

Irregularities and Errors to be Avoided in Agricultural Co-operation.

In an article on the above subject appearing in a recent number of the *Monthly Bulletin of Economic and Social Intelligence*, it is stated that State action in behalf of co-operation is not intended to take the place of, but only to awake and revive, the free energies and economic forces of the organised farmers, leaving them all the responsibility. Therefore the subventions granted by the State must never form the financial basis of the society. The members must arrange for contributing the necessary capital.

In co-operative *credit* societies, we must admit the very great importance of the book keepers being persons duly prepared for their work and absolutely trustworthy. It is necessary always to keep an eye on the economic situation of the members; to examine rigorously in each case if the applicant for credit really deserves it; to supervise the use the borrower makes of the money received and especially to see that the savings deposits are not immobilised in mortgage loans, as that conflicts with the idea of personal credit. Frequent and thorough examination must be made.

In the case of co-operative *purchase* societies, farmers should be prevented from installing large warehouses and storehouses, unless they have abundant capital and reserve funds.

Censure must also be passed on societies of very small farmers that, without capital of their own, work not only as co-operative credit societies and societies for purchase of every

kind of goods, but also buy buildings in which to instal themselves ; and further, besides engaging in business of the most varied kind, undertake the working of mills, co-operative dairies, etc. It is also to be deplored that many agricultural co-operative societies buy and sell articles of food and manufactured produce, without the commercial experience indispensable for the purpose.

With regard to Co-operative Societies for the *Collective purchase of Machinery*, it is observed that the results which some of these have given have not been good, because the co-operative form had been adopted in cases in which it was not suitable. It is besides impossible for such societies to have a large number of members ; further they cannot as a rule be called real Co-operative Societies.

In the Co-operative Societies for *production and sale* are observed the most serious defects. The leading principle of co-operation for production and sale is the association of small farmers, in order that they may enjoy the same advantages as the large landowners, that is, have at their disposal, credit, implements for production, etc. In the co-operative societies for production more than in any other class of co-operative societies, there must be a spirit of self-sacrifice and mutual understanding among the members, since they have usually to meet a large initial expenditure. But there are some members who regard the co-operative society as a collective undertaking with interest opposed to theirs as individuals. Others, ill-informed, think that the state will pay the greater part of the initial expenses, by means of its subventions and so on.

"Members must be informed, that, as in the case of every business which has to provide for the building of a large edifice equipped with machinery, etc., they must for a time accept lower prices for their produce and must think how they may soonest extinguish the debt contracted for installation expenses, since it is in this way that they, as constituting the co-operative society may, in time, become proprietors of an industrial establishment, which would amply compensate them for their sacrifices."

It must not be thought that the success of the society is secured if the above principles are conformed to. It must be able to count upon a certain and continual supply of produce ; another condition of success is that the society should have for its field of action a locality the production from which corresponds with the object. The situation must therefore be studied beforehand, in order that a bad harvest, a hailstorm or any unforeseen event may not involve the ruin of the society.

With respect to the *Federations of Co-operative Societies or Central Banks*, the following errors are those most commonly met with.

Without specially insisting on the two evident errors which, by good fortune, are only very rarely met with (as, for example, speculation, the use of letters of exchange of the affiliated societies in order to obtain money, opening books of fictitious deposits, the extension of credit beyond the affiliated societies, negligence of the Board of Management and the Council of Supervision in the accomplishment of their duties), it is observed that some Federations do not keep a just proportion between their own funds, which are too small, and their borrowed capital. In such case, it is necessary to increase the paid up capital and reinforce the reserve fund.

Another still more serious error is that certain Federations do not care sufficiently that their own securities should be easily realisable and so run the risk of finding themselves in serious difficulties whenever at a given moment large demands for withdrawal are made by their depositors. The confusion existing between *land* and *personal credit* when recourse is had to mortgage operations to satisfy the requirements of personal credit contributes to this. On the other hand, there are cases of immobilisation of the surplus funds, in contributions to the initial expenses of co-operative societies for production, or in purchase of real estate, etc. What also prevents the fluidity of capital is its investment in securities the value of which fluctuates.

A federation acting as Central Bank may, with due precautions, occupy itself in the purchase and sale of agricultural produce, but only to a certain degree, avoiding all risk and working always through agents. But the principal duty never to be lost sight of, is that of striking a balance between the necessities and the surpluses of the affiliated societies, receiving the deposits of those that have surplus capital in order to give it in the form of loans to those in need.

Associative Marketing.

It is not adequately realised that selling is, as difficult, if not more difficult than producing.

How Americans have tackled with this problem is told in a compilation of various official reports, in the September number of the *Bulletin* of *Economic and Social Intelligence.*

American farmers and growers complain that they receive only from 30 to 50 per cent. of the ultimate price paid by the consumer, and accuse the middlemen of exploiting agriculture; while consumers in the towns are continually lamenting that many farm products are difficult to obtain and unreasonably dear. The middlemen, on their part, say that they gain only the legitimate profits of a difficult and speculative business dealing with fluctuating markets, on the side both of supply and of demand, and often with perishable foodstuffs. All three classes finally, unite in complaining that the railways fail to provide an adequate service, and often charge prohibitive rates. Two things are clear; first, that expenses of marketing form an undue proportion of the total cost of many farm products; and, second, that the only persons at present possessing any considerable knowledge of market conditions are the middlemen.

Investigations instituted to ascertain the percentage of consumer's price received by the farmer for certain sample products revealed that, on an average, the dairyman received a bare 50 per cent. of the retail price paid for milk; the farmer, 55 per cent. of the consumer's price for poultry, etc....A special enquiry in 1909, into the high price of beef established the fact that the retail price was, on an average for the United States, 38 per cent. above the wholesale price received by the slaughtering houses.

The general conclusions which the Secretary of Agriculture drew from the investigations was that the consumer appeared to have no real ground for complaint against the farmer for the price he paid. The cost of transport, generally speaking, added a percentage increase to the farmer's price that was not large. The dealers had risks that were practically small, except credit sales and such risks as grew out of their trying to do an amount of business that was small as compared with their number. "The distribution of farm products," "is considerably involved, and burdened with costly features." It is indeed generally admitted that there is much overlapping and waste between the producer and the consumer.

There is waste, in the first place, due to marketing produce in bad condition or at the wrong time. Fruit and vegetables, for example, are often unsaleable when they reach the market, as a result of carelessness in handling or delay in transit, or of both combined. Much perishable produce is wasted through a lack of storage facilities both in transit, when the distance is great, and on terminal markets when, as frequently happens, they are overstocked with certain products. Even on a glutted market, it should never happen that tons of valuable produce have ultimately to be carted away as refuse.

Apart from such instances of actual material waste, there is constant loss due to inefficient, uneconomical methods. Another thing is the existence of a wasteful system of barter where the farmer sins in shoving goods on the retail dealer, and the latter in wasting no love on them, both taking the chances of profit as they come. There is waste in the practice of consigning small quantities of produce at high freight rates.

Waste occurs again in the overlapping and duplication of services in distribution. It often happens that there are four or five buyers in a district where one would suffice,

if indeed the services of even one are necessary. Between producer and consumer it is quite normal to find three or four middlemen engaged in handling the same product.

And it is an undeniable fact that producers are unable, in a vast number of cases, to obtain a fair competitive price, because they are as a class in a position of economic disadvantage. Prices become depreciated owing to the adverse influence of 'rings' formed by local brokers and buyers.

Co-operative selling agencies have dispelled many of these defects and the American farmer now fairly gets the price of his produce.

These marketing Associations are almost invariably farmers' organizations, without subscribed capital or with only a nominal amount, described as "co-operative non-profit associations" formed to conduct the business of selling agencies. They are incorporated under the company laws of the separate States of America but are permitted a wide latitude of freedom to adopt bye-laws which do not conflict with the laws of the State. Thereby they gain a constructive character which can cope with the exigencies of a fluctuating market. Here is the working of a typical association, the *Exchange*.

The *Exchange* is a co-operative marketing association organized under the laws of Virginia in 1900. In 1912, the association shipped 4,600 cars of potatoes, 230 cars of strawberries, 150 cars of cabbages, and 100 cars of onions—the output of between 2,500 and 3,000 farmers.

The paid-up share capital is 42,000 dollars, and there is an accumulated reserve of 80,000 dollars. Members need not be shareholders.

There are thirty-four local divisions, each of which elects a director of the general board, and an agent for each of its shipping point. The general board appoints inspectors so that they may be free from local influence. Much of the administration, and the shaping of the general policy is left to the general manager and the secretary. Five resident salesmen are employed in important market centres, and local brokers are employed in others. In a great many towns, direct telegraphic communication is maintained with wholesale buyers.

The general office is in telephonic communication with each of the forty-four shipping points. Early each morning the local agent reports the probable extent of his shipments for the day, and from time to time notifies the number of cars actually loaded and awaiting sale. All sales are made by the general office upon telegraphic quotations open for acceptance on the day of offer only.

At the shipping points, the local inspector examines each load delivered by the growers, and if it reaches the standard fixed by the association as to quality, condition and packing, he permits the barrels to carry the "*Red Star Brand*"—the registered trade-mark of the association. Sales are made f.o.b. loading points, the buyer to assume the risk of delay or normal deterioration in transit. Many losses are sustained each season from damage which cannot be shown to be due to causes fairly included in the buyer's risk, and these, as well as the occasional losses due to non-payment, are borne by the association.

All expenses of the association are met by a commission of 5 per cent. on regular sales and of 3 per cent. on the small quantity of produce dealt with locally. In future, only one half of the annual net earnings is to be carried to the reserve fund ; the remainder will be distributed among the growers in proportion to the amount of produce they contribute.

The articles of the constitution bear a wholesome democratic character and in the twelve years of its existence, the Exchange has vastly expanded the territory available as a market for its products, and the output of the district has been trebled. Through its requirements as to quality, enforced by inspection, it has standardized the products which it sells, eliminated economic waste in the old fashioned chaotic manner of gathering and marketing the crops, benefited the consumer, and secured higher prices for its members.

These agencies take charge of any disputes arising with respect to sales. They supply

accurate information on market conditions, especially as regards the movement of supplies towards market centres, from competing sources as well as well as from their own district. They often instruct growers in the cultivation and care of fruit and advise them when to pick.

An association occasionally does no more than pool the products of its members, and make a collective bargain with the local buyer. Even at this stage, an association controlling a considerable part of the product of a district is already in a distinctly advantageous position, and can generally secure an appreciable advance in price.

The next stage is where the association owns a central packing house, loads the produce, and offers it to competing markets in carload lots. Here the association has to meet the competition of the local buyer who attracts the custom of growers by offering them cash payment for their products. In shipping through their own organization, they may have to wait some time before they receive payment, and, in the meantime, have to bear the risk of a market which may be a thousand miles away Associations in their early days have suffered severely through the defection of members tempted by the cash terms of the local buyer, but many of them have an ingenious provision allowing members to sell to the latter when he offers a price above the market rate, on condition of their handing over to the common funds a percentage of the higher price obtained. Since no dealer can continue to offer prices above the normal, and the associations are constantly increasing their knowledge of available markets and, with greater credit facilities, will be able to make advances on delivery, we may conclude that they will continue to strengthen their hold on the members, to the exclusion of the local buyer.

At the next stage of development, the associations have grown into strong selling organizations with a powerful influence in establishing prices. They employ a highly paid manager, and exclusive selling agents in important centres; sell a large proportion of produce at public auction, or direct to wholesale dealers ; and are able to effect large economies in transport and reductions in commission paid for handling their goods.

A more complex form of organization is the Co-operate General Exchange, which acts as the sole middleman between the producer and the consumer. The members therein are no other than the farmers and consumers themselves. In some States, a plan is being considered, however, by which the farmer will receive full wholesale prices for his goods, while the Exchange will sell to its customers at 10 per cent. above these prices, to cover expenses, depreciation and reserve.

Public markets in many States of America are supplanted by Co-operative markets. The market Association buys the article outright from the producer, paying according to quality and density, and the demands of the season. Any producer, whether member of the Association or not may sell to the market. The goods are graded and packed under co-operative management, and sold under the name and with the guarantee of the association.

Under a system of co-operative selling, much of the heart-burning of the producer occasioned by the greediness or avarice of the middlemen, or the complaint of the consumer against the falling purchasing power of his money, or the ill-luck of the retailer in the perilous loss of fluctuating markets may be avoided.

Co-operation in Assam.

It appears, in Assam, during the period of nine months dealt with in the latest Annual Report, the number of co-operative societies has risen from 142 to 188, the number of members from 9,758 to 10,945, and the working capital from Rs. 4,91,411 to Rs. 5,56,098. Four societies only failed to work at a profit. The aggregate reserve funds increased from Rs. 32,407 to Rs. 47,202.

An important feature of the work of the period was the constitutions of four banking unions and two other unions.

The Industrial World.

The Silk Industry in Mysore.

The Government of Mysore have appointed Signor Washington Mari, a graduate of the Royal School of Sericulture, as their silk expert to consider and report on the question of the improvement of the Silk Industry in Mysore. The expert will be placed in charge of the Silk Industry and he will also be in technical charge of the silk filature started at Channapatna under the control of Mr. Chatterton. It will also be one of Signor Mari's chief duties to train up a competent body of local sericulturists who will be able to carry on future work after his engagement terminates.

Attar of Roses.

A method of obtaining the perfume on a small scale described in an old issue of the *Queensland Agricultural Journal* is as follows :—

Gather a quart of rose leaves from fragrant roses after the dew is all off. Do not pick them soon after rain, as they are not so fragrant then. Put a layer of the leaves at the bottom of a wide-mouthed glass bottle, sprinkle with salt, and then cover with a layer of absorbent cotton made wet with pure olive oil; add another thick layer of rose leaves, sprinkled with salt, and fill the bottle with alternate layers until the bottle is full. Tie a piece of oiled silk (double) over the top of the bottle; set it where the sun will shine on it all day for two weeks; then uncover, and extract the oil from the cotton and rose leaves. This method yields a perfume superior to most which are sold.

Coal in India.

The total quantity of coal produced in India in 1878 amounted to only 1,015,210 tons. In 1908 the output was 12,769,635 tons, or about 12½ times as much; but the progressive record of 24 successive years was broken in 1909, when the production was returned at 11,870,064 tons, though it exceeded the output of 1907 by some 723,000 tons. Considerable quantities of coal won in these two years consisted of very inferior coal. In 1910 the production amounted to 12,047,413 tons, an increase of 177,349 tons over 1909, but the figure still fell short of the output of 1908 by 722,222 tons. In 1911 the production almost reached the record of 1908 and amounted to 12,715,534 tons. The output of 1912 amounted to 14,706,339 tons and surpassed all previous records. To this may be added some 294,000 tons estimated to have been taken out from the mines by miners for their own use. The total production in 1912 would thus come to some 15,000,000 tons, but for purposes of comparison the figure of 14,706,339 tons first stated must be adopted.

Preservation of Fruit.

In spite of the very substantial amount of capital already invested in fruit growing in diverse parts of India, and the undoubted progress that is being recorded year after year, the industry may—when regard is had to the great future foreshadowed—be said to be in its infancy. In a climate like that of India, and more particularly in those parts of India where the greatest consuming and exporting markets are situated, temperatures are unfavourable to the preservation of fruit. For this reason, problems of transportation and preservation are found to be much more crucial than those of production. Some information on this subject was furnished in a note on page 623 of the *Wealth of India* for September. It is difficult to see how they are to be solved unless some measure of combination be effected among the owners of orchards. But with a perishable commodity like fruit such combination must, if it is to be effective, be very thorough and most strictly observed. In the absence of central co-operative establishments for the preservation or sterilization of fruits intended for distant markets, it becomes necessary that individual growers should furnish themselves with some means of bottling, canning or otherwise preserving such fruit

as is not saleable in a fresh state or such as commands a better market in the off season. A considerable mass of information about such appliances has been collected in the Commercial Intelligence Department, Calcutta, and may be had there.

Difference Between Cement and Concrete.

To many persons the words "cement" and "concrete" that nowadays enter so largely into building construction are synonymous terms. They are by no means the same thing according to *The Technical World Magazine*.

In the first place, Portland cement is a manufactured product obtained from lime rock and clay, or similar aluminous raw materials. Its preparation involves drying, burning and grinding in order that, when finished, it shall be in the form of a light gray powder or flour. This powder is of such exceeding fineness that the grains thereof may be made to pass through a sieve containing forty thousand holes to the square inch of surface.

Modelled into any desirable form, cement shows a high crushing resistance, together with a high tensile strength. It will sustain almost any load without injury to itself, showing no cracks or other elements of decay that attack other materials.

"Concrete" implies the use of cement in conjunction with sand and crushed rock, and in such proportions as will develop the highest value of the cement for practical purposes, at the same time bringing it within the range of buyers who do not wish to employ Portland cement.

"Reinforced concrete" means the use of concrete in conjunction with steel so placed as to contribute the tensional value of the steel to the total mass. Columns thus constructed will sustain almost any concentrated burden and are being extensively used in engineering.

Small Industries.

A correspondent writing in *Capital* points out that the decay of the small industries of India is a subject upon which many writers have exp.nded both time and ink, without offering any practical solution. They were not men of the trade, and what they had read about similar industries, as they exist in Europe, was enough to prevent them from understanding the situation as touching the Indian artisan. And so the real revival seems a long way off. Small industries are associated with small profits; they depend, generally to a large extent, upon hand labour, except such work as is done entirely by a machine, like knitting and sewing, and they flourish best among people who possess enough of intelligence and originality to obtain the utmost results from the thought and labour they expend on the work. Among the best examples are the toy makers in the German forests, the basket makers of Austria, the Russian peasants who in the winter take up copper and light iron work and wood turning, and, also the high class toy makers of Paris. The cheap French toys of tin and metal are made in factories employing a considerable capital. It is only necessary to observe the extent to which toys of European make are displayed, not only in the large towns of India but also in village fairs, to realise the field that exists for the manufacture of many of these articles in this country. But when we remember how the toy maker in each of the above countries has had a long and thorough training, resulting in an intimate knowledge of his work and of all the materials used in it, we begin to realise the difficulties that beset the reformers who would give serious aid to the small industries of this country.

A Rival to the Cocoanut.

A recent number of the *British Export Gazette* contains the following interesting paragraph :—

A new rival to the cocoanut in the making of copra is coming into a certain prominence, and investigation has proved that British Honduras has a valuable product which is at present unworked. This is the cohune nut, which is about the size of an ordinary egg, with a kernel—which gives the oil—the size of a nutmeg. The treatment of the cohune nut, however, needs special machinery, as, according to one correspondent, up to the present the

nuts have broken the machines, instead of the machines breaking the nuts! At the request of the correspondent referred to, I have obtained the opinion of an authority on this point, and he seems to think that the difficulties that have arisen may be due to the fact that the nuts have in many cases not been in suitable condition when cracking was attempted. Be that as it may, it has been proved that they contain as much as 71 75 per cent. of fat, and give copra worth £30 a ton, so that I see a very valuable and lucrative industry ahead for British Honduras if the necessary capital and enterprise are forthcoming, and meanwhile an opportunity exists for the introduction of special machinery for cracking this extremely hardshelled nut.

The Uses of Talc.

Talc, derived from soapstone found in various quarters of the world and in many of the United States of America, is generally marketed as rough from the mine. It is sawed into slabs, from which are manufactured various objects, or it is ground into powder.

A great deal of the ground talc is employed in the manufacture of paper. It also enters into the making of moulded rubber forms and foundry facings and paints, but the form in which it is most familiar is the toilet powder.

Not only is talcum dusted into gloves and shoes to obviate friction, but it is also blown into conduits to ease the introduction of electric wires or other conductors.

Soapstone is largely employed in the manufacture of laundry tubs and similar articles. The very best grades of talc, free from flaws, are sawed up to make pencils or crayons. Gas-tips are also made from talc.

The above notice of the uses of talc, taken from "*Harper's Weekly*," does not indicate its reputed use in the renovation of damaged rice. Old, discoloured, worm-eaten rice is said to have been so treated that it takes on the appearance of new rice. We need hardly say that grain so treated has been reported to have proved very injurious to native labourers in tropical countries, whose food rations consist largely of rice.

Neutralizing the Pungency of Ginger.

In the August issue of the *Wealth of India*, a note was published regarding the export of preserved ginger from China. The following useful hints in regard to the removal of the pungency of ginger are taken from the *Journal of the Jamaica Agricultural Society*.

The ginger is washed and the skin is scraped off. It is then punched with forks and washed in rice water (the water left after washing rice) to improve the colour. It is then boiled in three or four changes of refined sugar and water for one or two hours, until it is properly soaked, and then put in barrels and covered with syrup.

In the case of dry preserved ginger, the wet ginger is strained till dry; dry sugar is placed on bamboo matting, and the ginger is rolled in it till it is coated with sugar.

Stem ginger is the young and tender shoots on the roots. Cargo ginger is what is left after cutting off the "stem".

The method adopted by the Chinese in cultivating this plant, is as follows:—The rhizomes are planted in the spring in ridges about I foot high and 2 feet apart. The rhizomes are set in ridges about 6 inches apart. Low lying ground is generally selected, and water is kept continually between the ridges.

When the young shoots are from 6 inches to 1 foot above the ground, the plants are heavily manured with urine or nightsoil mixed with water. This is repeated at frequent intervals.

About three months after planting, the first crop of ginger is ready. This is known as "young ginger," and is the least pungent and the most expensive. If the rhizomes are allowed to mature, which will be between October and December, they become more pungent, but nothing like the Jamaican.

Trained Labour for Indian Industries.

The *Textile Journal* apprehends some difficulties to the orderly development of Indian industries. References are made now and then in the Press as to the apparent possibilities of establishing in India factories to supply the

millions with the common necessaries of life. With the multiplication of facilities for technical education one great bar to progress in the development of industries in this country will be minimised, but, it is possible, says our contemporary, we shall be forced to the end of time with a lack of constancy in the skilled labour that will naturally have been the outcome of the training referred to. The tendency so deeply rooted in the native character of availing of every pretext to take leave would become a fatal element against successful competition even with manufacturers thousands of miles away. The question of outturn also would always more or less operate against economical results, for in this respect the natural characteristic of the Indian workman does not conduce to diligent application to duty. Compared with his European colleague he is often undisciplined, frequently indifferent, and invariably casual in the performance of his work. In proportion to his wants, he draws a pay that gives him an independence which rarely comes in the life of the other, though in the latter case it may be bragged about a good deal, and he works or rests at will. Legislation for curtailment of working hours signally fails to adjust things from an equitable point of view. There is no compensating clause for the employer. Any statutory recess, or shortening of the time of labour is invariably supplemented by equal periods at the sweet will of the operative, a factor that has to be taken into consideration in estimating profits which, fortuitously in some lines for the present anyhow, bear the impost, though in others would mean hopeless results. So when one speaks in a general way of entering the field of manufacture in India he is met, at the very start, with apprehension of difficulties with regard to trained labour, and even with this overcome, he finds obtrusion, at every point, of those undesirable characteristics, already alluded to, which operate against success.

Occupation and Mentality.

A German publicist, Adolf Levenstein, has devoted many years to a systematic and ingeniously planned study of the influence exerted on man's soul life by modern industrial conditions—or rather, by the transformation of the old-time "artisan" to a modern "operative." It is the presence of machinery, interposed between the workman and the raw material, that counts for most to-day.

What struck him very soon was the sharp division of those he met into two classes; one mentally alert and clear, the other mentally sluggish and vague. And a very little questioning brought him face to face with the inevitable conclusion that the latter class of workers were occupied in some very monotonous trade, while the former were blessed with a work demanding attention and offering variety. The results, which were arrived at by long correspondence with workmen as to their mode of thought and occupation, constitute, on one side, a serious arraignment of modern industrial methods, and, on the other, a very encouraging evidence of the cultural possibilities lying dormant within the labouring classes.

They are given in the latest number of the *American Review of Reviews.* We quote them in full :—

After a series of preliminary questions as to name, age, numbers of working years, occupation, and so forth, the first question aiming straight at the heart of the inquiry was whether the workmen found it possible to think of other things while at work. Among the coal miners and metal workers 25 per cent. declared outright that they had to give their whole attention to the work, not so much because the work demanded it, as because the work prevented them from thinking connectedly of anything else. Many complained that the noises and unpleasant conditions connected with their toil influenced their whole beings. "A coarse work makes the spirit coarse," wrote one.

Among the textile workers, on the other hand, only 15 per cent. found their entire attention demanded by the work, and in general, their answers indicated greater mental freedom—although this was balanced by another set of detrimental effects. For while

their work could be handled mechanically without danger, it was also the most monotonous of all the kinds investigated. A most remarkable discovery made by Mr. Levenstein was the influence exercised on the weavers by the rhythmical movements of the looms. This seemed to rule and sway the brains of the weavers so that all their thoughts tended to shape themselves metrically. It was found that most of their thinking was imaginative rather than speculative, and not less than 817 poems were submitted by members of this group in answer to Mr. Levenstein's questionings.

That the machinery tended to release mental forces became an inevitable conclusion as Mr. Levenstein's investigations proceeded. Unfortunately he was also compelled to conclude that this result was caused by antipathetic rather than sympathetic reactions: that is to say, the thinking of the workmen was forced on them as a means of mental self-preservation. This was indicated by the fact that so many of the answers revealed undisguised dislike, or even hatred, of the work in hand. And almost invariably monotony was given as the reason for this feeling. The dislike for their own form of work was strongest among the textile workers, of whom no less than 75 per cent. confessed to it. It was least felt among the metal workers, to whom a comparatively high degree of initiative is granted, but even among them 56 per cent. failed to take any interest whatever in their work.

Most characteristic were the answers received in response to the question what kind of work they preferred to do. Only 10 per cent. of the weavers, and a very little larger percentage of the metal workers and coal miners, wanted to continue the work already theirs. Most of the detailed answers indicated above everything else a desire for some kind of work enabling the worker to see the finished product of his toil.

The investigation of the reading matter appealing to the different classes of workers showed that scientific and other informative literature was read by 27 per cent. of the metal workers, by 14 per cent. of the weavers, and only by 11 per cent. of the coal miners. On the other hand, only 7 per cent. of the metal workers professed a liking for acknowledged "trashy" literature, while not less than 39 per cent. of the coal miners indulged in this kind of mental relaxation. These figures do not include propagandist literature relating to Socialism or the trades union movement. Literature of this latter kind was constantly being read by 43 per cent. of the metal workers and 44 per cent. of the weavers, but only by 19 per cent. among the coal miners. A tendency to a utopian faith in the future of the working-class movement evidenced itself particularly among the textile workers, one of whom wrote: "I have faith, and my faith in itself is a piece of millennium." Equally striking, however, was the capacity for independent thinking shown by individval workers—as, for instance, by the one who wrote: "The final goal must be man himself, and not any kind of political organization."

Of special interest proved the character of the reading chosen by those turning to serious literature. Schopenhauer was found an unexpected favorite among them. Schiller, Goethe, Kant, and Lessing were others, while more logically, the German materialistic thinker, Bruchner, had attracted a large number of readers among the socialistically inclined workers. As a rule it was found that the works exercising most general attraction were those dealing with the actual life of nature (not geography), the spiritual (rather than political) development of man, and the organization of the universe.

Refrigeration.

The extracts below are from the *Times Engineering Supplement* of August 27th:—In view of the International Congress of Refrigeration to be held at Chicago next month, it seems pertinent to inquire into the present position of the refrigerating industry. That it is of importance is evident from the fact that this year's congress is the third of the series, the first having been held at Paris in 1908 and the second at Vienna in 1910. Although the

industry has only some 34 years behind it, it is already flourishing and worldwide, and is destined, no doubt, to a still more important future. The principal reason lies in its intimate connexion with the primary traffic of the world—the supply of food. To an increasing extent perishable foods are being handled and distributed by powerful central agencies and these bodies have the money to put down expensive machinery, such as was altogether beyond the reach of their smaller predecessors.

APPLICATIONS.

Refrigeration has many and varied applications, and it is employed for the following purposes among others :—Storage of all kinds of provisions, fruits, rubber, hops, and valuable furs ; ice-making, cooling and storing beer and wort in breweries and milk in dairies ; chilling lard and fat and margarine ; refining oils, and extracting paraffin wax ; concentrating solutions, acids, etc. ; refrigerating morgues and hospitals ; cooling buildings and theatres detaching optical lenses from the grinding matrices ; bacon curing ; clarifying and ageing wines ; retarding the growth of bulbs ; and storing out flowers. Purely engineering applications include the freezing of the ground round mineshafts and tunnels to avoid flooding, as in the case of the tunnel for the Metropolitan Railway under the Seine, and in sundry pit shafts, both in this country and in Germany ; the cooling of powder magazines on ships of war ; and the drying of air for blast furnaces. The last application, especially where the compressors can be driven by blast-furnace gas-engines, permits of large economies in the cost of producing steel, as the fuel which would otherwise go to dissociating the water-vapour present in the air is almost all saved. Since about 13,000 B. Th. U. are necessary per lb. of water, it is obvious that the waste on the ordinary system is considerable.

Refrigeration has also brought the transport and distribution of food to a high pitch of perfection. For over-seas traffic, steamers with refrigerated holds are used in great numbers, large freezing and chilling works being provided at the points of departure, and large central stores at the points of arrival. Similarly for land transport, refrigerated cars are employed in conjunction with pre-cooling stations at the points of shipment (the goods being cooled when actually in the cars by means of flexible air pipes) and stores at the various destinations.

THE MANUFACTURE OF MACHINERY.

The development of the refrigerating machine itself, to return to the engineering side of the question, has advanced *pari passu* with the widening of its field of application, but British engineers, it is to be feared, have not given this aspect the attention it demands. They are, it is true, hampered by the smallness of the market for machines in this country, as compared with the United States, but, even allowing for this, they can scarcely claim to be as progressive as the Americans and some other nations. The field in which they have been most successful is in the development of efficient machines of small size for the use of butchers, dairymen, hotel-keepers, etc. The reason is probably that the users of these machines in this country are more numerous, owing to their relatively greater spending power, than they are elsewhere, so that the supply has arisen to meet the demand. In this department this country is certainly abreast of its competitors.

The theory of the refrigerating machine is now fairly well established, and no further developments of importance can be expected. So far as books of reference are concerned, the works of such investigators as Carnot, Zenner, and Ledoux are still standards which do not require replacing, and recent additions are of merely minor importance.

Indian Industrial Development.

A Swadeshi Mela was held recently in Calcutta and it was opened by H. E. Lord Carmichael who made a very saggestive speech pointing out certain lines in which Indian industries might be developed.

SWADESHISM.

His Excellency pointed out that Swadeshism

was a very practical form of patriotism. It aims at developing and organising the production and manufactures of one's own country so that they may hold their own in competing with products of other countries. It differs from some other methods which aim at a similar end in that it tries to attain that end only through the intrinsic merits of the products themselves. It stands quite apart from any protective wall of tariffs or from any political feelings of exclusion. As such, Swadeshism, if successful, must benefit not only the people of the country where it is practised but all who are in any way brought in touch with them.

FAILURES.

Referring to the want of success of some Swadeshi enterprises in the past, H. E. said that it is always difficult to start a new enterprise, especially one which competes with enterprises which have fought the way successfully through difficulties.

SMALL INDUSTRIES.

"I understand that you try to help those who carry on small industries. This is a thing which is being attempted in many countries. In India there are many small industries well worth helping, industries which depend mainly on the skilful handicraft of those who practise them. As far as I can judge, such small industries are peculiarly worth helping here. You have skill passed on from parent to child and developed to an extraordinary degree. In some crafts you even gain a great advantage from some of those habits which are often said to keep India back in the industrial race. It seems to me that what is most needed in these industries is organisation, in bringing together those who make the goods and those who want to buy them. In this matter I am afraid those parts of India which I have seen—I have only been in a few parts and may be speaking with the exaggeration of a very limited experience—but the parts where I have been, do seem to me deficient in organisation. Babu Surendra Nath Benerjee has referred to the common impression that many Indian gentlemen are not inclined to do manual labour. That disinclination is not peculiar to India, though circumstances have allowed more people in India than in some other countries to act on it. But in this matter of organisation hard manual labour is often not necessary. What is wanted is knowledge of facts, knowledge of what is being made in your country and where it is being made, of what people want and where they want it, and also skill in bringing to the notice of people who perhaps do not know what they want—things which, when they see them, thay will begin to find they do want."

LARGE INDUSTRIES.

Referring to large industries His Excellency observed :—I take it, it is not merely of these small industries that you who organise this Mela are thinking. You look forward to the time when Bengal shall take a leading part in the industrial development of the world on a large scale. It was no doubt to that time that the vision of Surendra Babu when he was speaking just now turned.

Possibly some of you may think it a mere dream ; but many of you believe it is dream which sooner or later can be realised. It must be difficult to realise it, and it can only be realised by determined effort. It certainly will never be realised if we only talk about it and do nothing. All honour then to those who try to do something:—even if they fail they are making it easier for others to succeed. In all industries the pioneers often have a hard time. Indians are beginning late in developing large industries, but they may develop these all the faster if they profit by the experience of other peoples who began earlier.

I have mentioned your intellectual activity, you must correlate that with industrial and commercial activity. Some of you are doing that successfully already. I daresay many are doing it whom I have not come across. When I hear—as I constantly do—of the large number of educated Bengalis who find it difficult to live in accordance with the standard of comfort which they wish to live up to (the

standard of comfort I know varies everywhere' and it is not easy for any one like me—who is not of the country—to know what it really is—but that is what I am told by Bengalee gentlemen who tell me they have felt it themselves)—when I hear this, I cannot help thinking that the day must be near when there will be a determined attempt on the part of such men to use industry and commerce as a means of securing their own comfort and at the same time helping their own country. No doubt the cultivation of the soil will for a long time at any rate—perhaps always—be the main industry of the country. I am not here to tell you how to develop your country. The people of any country who, and whose forefathers have been dealing with that country must have learned in the best of all schools —the school of practice—how to deal with it, and the most any incomer can do is to encourage and perhaps make a suggestion here and there as to how old practices may be brought to fit in with rapidly changing conditions. In manufactures it is somewhat different ; there the outsider can sometimes give useful advice. But I am not an expert: I can only advise you to listen to experts and having listened to think for ourselves how their advice suits with your circumstances.

Capital on a large Scale.

One thing I would ask you to remember; nothing can be done on a large scale without capital. I am sometimes told that the people of Bengal are very poor; I read that often in the newspapers—at other times I am told of the enormous quantity of money which is every year poured into Bengal. Obviously there are both rich and poor. What I hope is that the money brought into Bengal will be used to good purpose. If it is used productively it seems to me there can be no doubt Bengal will soon become a very much richer country than it is. Up to now Bengal industries have depended for the most part on European capital greatly to the benefit both of Europe and of Bengal. But there is plenty of room for Bengali capital too. And it is only the Bengalees who can provide that. Government may help your boys to get knowledge which will fit them to produce wealth as well as the boys of any country can; but if they are to have a chance of using their knowledge, there must be openings for them and capital is needed to give openings. I am told that much Bengali capital passes from hand to hand in the shape of lawyers fees. I hope those who part with it in this way are quite satisfied, and I hope those who receive it are equally satisfied. I am told many successful Bengali lawyers are keenly interested in Swadeshism. I am glad to hear it especially, if as I hope, they are growing rich. For they will help to provide openings I am told the rich men in Bengal have lent much money, but not often hitherto to help industries; and I am told industrial returns are not attractive enough. I would merely ask you to remember that your industries have to compete with industries financed by capitalists who are not accustomed to getting the interests which is often looked for by Bengali investors and that until there are men willing to invest money with the prospect of a return, no higher than that which suffice for the investor from other countries, it is needless to hope for a very great development. I am sure however that Bengali rich men are patriotic and I am sure they are intelligent. I hope therefore you may look forward confidently to the time when it will be clearly shown that Bengal is a country whose people make the fullest use of her natural anvantages. This Mela is meant as a step in this direction.

American Labor More Efficient Than British.

According to a report issued by the American Bureau of Foreign and Domestic Commerce, based upon a study of seventeen industries in the United States and Great Britain, it requires 18 per cent. more power and two and a half times more labor to do the same work, in the industries examined, in Great Britain than it does in the United States. Herein can be found one of the fundamental causes of the difference between wages here and in the older countries.

The Commercial World.

Essentials to Business Success.

"Amongst the first essentials to success, in my opinion," states the veteran Lord Strathcona in the *Strand Magazine*, "is that of being *interested* in what you have to do. After that comes *diligence*, and then *system*. But unless a young man is interested, first of all, in his work he cannot expect to succeed in it. I would therefore say if your heart is not in it, you are heavily handicapped in the race."

The Jute Trade in India.

Jute and its products represent on the average of three years ending 1912-13 eighteen per cent. of the total value of the exports of merchandise from India, the actual figures being Rs. 40·32 crores and Rs. 222·93 crores. For comparison, it may be mentioned that the value of exports of cotton and its derivatives is about Rs. 42·23 crores while rice and wheat represent, respectively, Rs. 28·28 crores and Rs. 14·67 crores.

Extinction of Goodwill a Sound Policy.

Remarks the *Pall Mall Gazette* :—The extinguishing of the goodwill item is a point deserving more than passing reference. It is a sound policy, and policy that should always be the aim of company directors. Goodwill is a fair weather asset only, and the less valuation placed upon it in balance-sheets the better. In the case of a joint-stock company, the shareholders of which are not contemplating selling their undertaking, the sooner it disappears and is forgotten the sounder the position. The goodwill item is the weak spot in many a balance sheet."

Royal Business Men.

To the young man in India, Government service and practice at law are still the goals in view. Trade and industry are not attractive and to several of them they are demeaning. Yet not a few of the rulers of the world are prosperous business men The most conspicuous example is the Kaiser, who includes among his interests a porcelain factory. The general conduct of it is based upon rules and regulations laid down by the Emperor. Indeed, it is said, the Emperor is not above engaging employees himself, adjusting their wages, and even designing certain of the wares turned out. The Emperor is a model employer, anxious as to the comfort of his men, who have been provided with cottages and pensions and given a share in the profits, which are reported to approximate £10,000 a year.

It is a matter of common knowledge that the Prince of Lippe-Detmold is a dealer in butter and eggs, while he has a side line, a busy brick factory that adds materially to his income.

The King of Wurtemberg is the proprietor of two hotels within his domains which are reported to be worth something like £9,000 annually to him.

The Emperor of Austria-Hungary, like the Kaiser, operates a China factory. This establishment, situated near the Austrian capital, employs more than 1,000 skilled workmen. The King of Saxony, too, has business interest of this character, though on a smaller scale.

Perhaps the most unconventional of the Royal business men is the King of Servia, who, in addition to several shops doing general trade, is said to promote the sale of a patent medicine and to run a motor-car agency.

The Appointment of Auditors.

Mr. M. Webster Jenkinson, F.C.A., of Messrs. Franklin, Wild & Co., Chartered Accountants, delivered a lecture recently to the London Chartered Accountant Students' Society, entiled, "The Audit of a Public Limited Company." In the course of his remarks the lecturer suggested a few alterations which might be desirable in the law relating to public limited companies, so far as auditors were

concerned. He considered that the greatest anomaly about the present system of the appointment of auditors was that although the auditor was supposed to be representative of the shareholders to check the accounts of the directors, yet in most cases he owed his position to the directors or promoters of the Company.

The most objectionable feature about the present method of appointment is that in many cases the auditor owes his position simply and solely to the fact that he has been the means of influencing capital. With the exception of certain of the large firms who are invited because the promoters think that their names on the prospectus will attract subscribers, it is a common practice to give the appointment to the accountants who can find the most underwriting. It is difficult to suggest legislation to prevent this abuse, but the position of an auditor is that of an 'independent person,' and it would seem most desirable that he should not be connected, excepting in a strictly professional capacity, with the promotion."

Business Enterprise in India.

The business enterprise of India during the month of August 1913 may be seen from the following abstract of companies registered in that month.

		Rs.
5	Banking Companies ...	2,59,969
6	Insurance Companies ...	31,60,000
1	Navigation Company ...	10,00,000
2	Printing, Publishing and Stationery ...	80,000
7	Trading Companies (other than specified above) ..	10,60,000
1	Cotton Mills Company ...	8,00,000
2	Mills and Presses (other than specified above) ...	70,000
1	Tea and Other Planting Company ...	1,00,000
2	Mining and Quarrying Companies ...	11,50,000
27	Grand Total ...	76,79,969

India and the Panama Canal.

It was predicted that the opening of the Panama Canal will tend to revolutionise trade all over the world. It is not known how far India would be affected in this mighty alteration of the course of the world's trade; but the *Manchester Guardian's* London correspondent understands that a Report which was recently prepared for the Japanese Government shows that the opening of the Panama Canal will, among other things, result in an increase in raw cotton imports from the United States, and in a decrease of imports from India. This will, moreover, enable Japan to place her cotton manufactures on the Indian market at a lower figure than is possible at present.

The Fruit Trade in India.

In the September issue of the "*Wealth of India*" was published an article indicating the directions in which the Railway Companies can help the fruit trade in India. In connection with this, the following question put by the Hon'ble Raja Kushalpal Singh in the Supreme Legislative Council and the answer given by the Government may be read with interest. The Raja asked, "with a view to helping the fruit trade, will the Government be pleased to consider the desirability of directing Railway Companies to weigh together and book as single consignments a number of packages of fruits when sent to one consignee and to return free of charge empty boxes from the markets to the sender?" The Hon'ble Sir T. R. Wynne replied :—

"The suggestion made by the Hon'ble Member will be conveyed to the Administrations of the different Railways."

Ingenious Method of Selling Books.

An advertisement in the agony column of the "*Times*" sometime ago announced that 300 francs per month could be earned all the year round by a few hours daily work by any one willing to undertake the translation of French into English, writes "*Truth.*" Application was to be made to "Le Livre Francais a l'Etranger," 21, Due des Lombards, Paris. The application produced acircular in imitation

typewriting announcing that the "Livre Francis a l'Etranger" was prepared to pay for translation at the rate of 1 fr. 50 for each page of thirty lines A list of books was given from which the translator could make his choice, in order to furnish a sample of his abilities, and all that he had to do in order to start at once would be to send 3 fr. 50 for one of the books and 0·60 for postage. It seems an ingenious method of selling books.

Cotton Futures.

An important judgment upon the legitimacy of transactions in cotton futures has been delivered in the Manchester County Court. After consultation with the Board of Trade, the trustee in an insolvency case sought to test the right of a cotton-broker to claim upon the estate for differences accrued upon speculative transactions with the bankrupt The brokers had dealt in their own names, had exacted a deposit as cover, and had paid or received upon the price declared upon the Liverpool Cotton Exchange weekly. The operator had shown no intention of taking delivery of the cotton bought, and the argument of the trustee was that the dealings were essentially bets upon the weekly price of cotton. Judge Mellor ruled that the brokers were entitled to recover, as they were not gambling, but acting as agents, and held that the weekly adjustments only regulated payment without converting the contract into a weekly one. He observed that a market for futures was absolutely necessary to enable manufacturers to carry out their forward contracts, and there was nothing illegal or gambling about such transactions. Gambling is the name freely applied by cotton-spinners to such operations indulged in by those who do not undertake them to balance an inherent risk. The judgment does not say that the operator was not gambling, but only that the brokers were not.

World's Enormous Demand for Cotton.

It would seem that great scope exists for the improvement of agriculture for the vast populations of China, India and Africa, as brought out by an able and informing paper read at the fourth Congress of the Textile Institute, Manchester, by Mr. E. H. Taylor on "Cotton Supply and Demand." He submitted a table showing the approximate production in bales of 500 lb. of the world's total crops of cotton, which indicated that in the comparatively short period of just over a quarter of a century the production of raw cotton in the world had increased by nearly 130 per cent. In his opinion the demand had on the whole proved greater than the supply. This was shown by the fact that these hugely increasing supplies had been year after year absorbed by the trade, and in many years cotton could and undoubtedly would have been consumed had the supply been available. This increase in demand had taken place in spite of a general increase in the commodity. The great growth in the demand for the products of the world's manufacturers in the future was not to be looked for so much from the highly civilised States of the world as from the enormous population existent in China, India and Africa. If the proportional increase of demand for cotton in the next quarter of a century proved to be as great as in the last 25 years, if it increased again by 100 per cent., we should require a world's crop of from 40,000,000 to 45,000,000 bales by, say, 1940.

Proceeding, the speaker said a great impetus would be given to production by the invention of a mechanical apparatus for cotton picking. Many attempts have been made, but none so far has been a complete success. The difficulty seems to be that as all the bolls do not ripen at the same time, the crop has to be picked three times by hand in order to obtain the full supply. The inventor of such a machine would not only reap a large fortune but would be conferring one of the greatest benefits upon humanity.

Trade According to Continents.

The following statement shows in *thousands of rupees* the value of the trade of British India in private merchandise exclusive of treasure with the several main divisions of the world:—

——	1910-11	1911-12	1912-13.	Share of total per cent.	Increase, plus, or decrease.
	Rs.	Rs.	Rs.		Per cent,
Europe	2,20,56,02	2,38,36,20	2,63,00,96	64·6	+ 10·4
Asia	82,39,61	88,73,55	94,81,63	23·3	+ 6·9
America	21,32,07	25,16,55	30,96,86	7 6	+ 23
Africa and adjacent islands ...	9,98,15	9,54,15	13,38,50	3·3	÷ 40·3
Australasia	4,97,75	4,61,53	4,73,94	1·2	+ 2·7
Total...	3,39,23,60	3,66,41,98	4,06,91,89	...	+ 11

Of the total trade with Europe 52·1 per cent was exports, which also represented 74·1 per cent. of the trade with Asia, 83·2 per cent of the trade with America, 67·3 per cent. of the trade with Africa, and 79 8 per cent. of the trade with Australasia.

The trade with the United Kingdom rose from Rs. 146 53 crores to Rs. 163·2 crores, the increase being Rs. 16·67 crores or 11·4 per cent. Her share in the total was 40·1 per cent., and her share in the trade with all British Possessions was 76·5 per cent. The trade with British Possessions other than the United Kingdom was Rs. 50·22 crores in place of Rs. 44·98 crores. That figure forms 12·3 per cent. of the total trade and shows an increase of 11·6 per cent. as compared with the previous year.

The trade with all British Possessions represented 52·5 per cent of the whole trade and increased by 11·4 per cent, that is to say, from Rs. 191·52 crores to Rs 213·43 crores

Trade with foreign countries represented 47·5 per cent of the whole trade, and increased by 10·6 per cent, that is to say, from Rs. 174·90 crores to Rs. 193·49 crores.

Periodic Cycles of Trade.

The financial crisis in the Punjab, which has imparted a rude check to Indian industrial enterprise, has given occasion to a writer in the *Commerce*, to investigate the present condition of trade in this country. "The crisis," says the writer, "comes at an inopportune moment, when India is making an earnest forward industrial move on the crest of a great wave of national, imperial prosperity, and the check given to this forward march is all the more deplorable when we think of the days to come, when the trade boom has slackened, when the money market is not so accommodating as it now is, when India has lost, in short, this, her great opportunity. For the world's trade moves in cycles and it will be a long time before this country has the same chance of commercial resuscitation which has been the case during the past few years."

The past twelve months, the writer states, have been characterised by—

(1) The increasing prosperity in all trades during the past three years.

(2) The aggregate abundance of the world's harvests during the same period.

(3) The extension of credit.

(4) The rise in prices and profits.

(5) The growing demand for money, and the consequent gradual increase in the cost of accommodation.

(6) The dullness of the stock markets and the decline in the prices of stocks.

What do these facts portend ? How much more will trade improve ? When will the climax be reached ? for trade cannot improve indefinitely. What will happen after the climax. ?

The writer sets himself to answer these questions, with the aid of a known fact in the history of commerce, namely, that of certain cyclic changes in the course of trade. They are according to eminent authorities on the subject :—

(1) In every quarter of the year there is an almost invariably increasing demand by the public upon the banks, beginning with the second week and culminating at the end of the quarter.

(2) In every year there is an increment and collapse, connected with the action of the seasons upon trade, the breaking up of the ice in the Northern Seas, and the ingathering of the world's harvests ; resulting in a gradually increasing demand for accommodation during the third quarter, reaching its highest point in the fourth quarter, and marked by a lull in the second quarter.

(3) In the course of about every ten years, trade experiences triennial progressive changes, this decennial period being punctuated as follows :—

(*a*) Three years of dull trade, with little demand for money, money cheap, credit fair.

(*b*) Three years of normal, or moderately good trade, greater demand for money, money becoming dearer, credit good.

(*c*) Three years of increasingly excited, or abnormal trade; large borrowings, money scarce, credit good.

(*d*) One, the tenth year, of speculation in trade, great demand for accommodation, money very "tight," credit extended, reckless commitments resulting in unnaturally inflated trade, followed by

(*e*) Over production, failing markets, credit dead, collapse, failures, panic.

(*f*) A return to the first of the series.

Taking as his guide, the condition of the Stock Exchange, the Bank rates, the extent of supply and demand, the trend of recent political events in England and in Europe, the writer says that, "we are in the tenth year of the cycle, which is characterised by speculation in trade, urgent demand for money, great stringency in that commodity, and extended credit, *i.e.*, the dangerous use of a mass of paper documents doing duty for cash, and out of all proportion to the stocks of currency."

He proceeds to say in conclusion "it points us to either 1914 or 1915 as being the probable year of overproduction; but current events, such as wars or exceptional harvests, may accelerate or retard the crisis. If, therefore, we are to foretell the exact moment of peril we must examine the combination of signs which herald its approach. The result of such an investigation is to make us suspect 1913 and 1914 as being pregnant with dangerous possibilities. As we have seen, the fourth quarter of the year is normally marked by an increased demand for accommodation at the bank, if then trade be unduly inflated, we must anticipate trouble during the Autumn. If this critical period in a boom year pass without a revulsion, we may hope for a temporary reprieve."

But as a set back to this depression in trade fluctuation, the following points are noticed:—

Joint Stock Banks have taken the place of small private ones. Many of the latter, in the old days, were not strong enough to tide over a grave financial crisis. The Joint Stock Bank of to-day has no private friendships, and exercises much more care in lending. So that when depression comes, it has far less out in speculative enterprises than the old private bank would have had.

Another point is that former panics have warned bankers, who now make preparations accordingly. Only recently owing to the scarcity of money, large sums have been called in, and this, by the way, is another reason for the low price of investment stocks on the Stock Exchange, as securities have had to be sold, by people who had borrowed on them, in order to repay loans.

Again, economic education amongst our traders in general is of a far higher standard now than it used to be, and gives us another factor of safety.

Therefore we need not apprehend a general shock; but we must expect a gradual slackening in trade, after it has reached its zenith.

Then people who have money to invest will find that there is no scope for it in trade, and that the rate of interest on deposits in banks has almost disappeared, and they will naturally turn to the Stock Exchange for a remunerative employment of their cash.

Impersonal Ownership.

Mr. L G. Chiozza Money writes in an English contemporary :—Many a long year has passed since Adam Smith attempted to demonstrate that it was quite impossible for joint stock enterprise to play any considerable part in the world of trade. He was very sure of his ground. It seemed to him that, as joint stock enterprise represented the use of the stock of a number of capitalists by mere employees, it would not be inspired in its management by that magic of ownership, which in the words of Arthur Young, was capable of "turning sand into gold." To Adam Smith, the ideal producer was, in his time, and would continue to be, a man who, employing his own capital, was so moved by the desire of personal gain that he would get a maximum of return from his capital.

It is easy to be wise after the event. Joint stock enterprise is now a commonplace to us all, and we know very well that in comparative efficiency the modern great joint stock undertaking is infinitely superior to the small individual concerns which excited Adam Smith's admiration. We know also that the triumph of company control has been so great that at the present time by far the greater part of British trade is in the hands of public companies. Here are the assessments to income-tax under Schedule D of profits from trades and professions, as far as these are classed under (1) "persons not employees," (2) "firms," and (3) "public companies":

INCREASE OF ASSESSMENTS UNDER SCHEDULE D.

	Persons not employees.	Firms.	Companies.
	£	£	£
1907-8	100,700,000	81,900,000	259,200,000
1908-9	100,900,000	80,500,000	291,000,000
	Stationary.	Falling.	Large increase.

(I do not add the figures of 1909-10, because these are not complete owing to the throwing out of the 1909 Budget by the House of Lords.)

JOINT STOCK SUPREMACY.

It will be seen that in 1908-09 companies were assessed to income-tax for £291,000,000, while "firms" and "persons not employees," taken together, were assessed for £181,400,000. Without further analysis, we see that companies control by far the greater part of British trade to-day. The figures given do not fully reveal their supremacy, however, for under "persons not employees," and also under "firms," there are, of course, included the incomes of barristers, solicitors, physicians, soldiers, sailors, actors, authors, and so forth. Income from retail trading is also included. If it were possible to confine the record to wholesale trade and to manufacturing, then the company supremacy would be found overwhelming. Observe, also, how rapidly the company superiority is increasing.

It should be borne in mind that the registration of a Joint Stock Company does not always mean the collective use of capital by a considerable number of people who are strangers to each other. It has been increasingly realised that the company form is a convenient method of expressing family and other partnerships. A family Joint Stock Company is as much an expression of the direct employment of family capital as an ordinary family partnership.

When this is allowed for, however, it is true that a very considerable part of British capital to-day is *owned impersonally and employed indirectly.*

It is a curious form of ownership which raises many interesting issues. It is all for good, under existing circumstances, that men of enterprise and of proved capacity should be able to wiled for the purposes of industry large bulks of capital subscribed by investors scattered all over the country or even all over the world. There are many undertakings which could never have been attempted, save by governing States, unless it had been possible for a large number of persons to subscribe

portions of capital with limited liability as to risk. Manufacturing and trading of a large scale is absolutely necessary if waste is to be avoided, a fact which Adam Smith forgot to take into consideration, and which John Stuart Mill perceived only dimly.

The Company as Employer.

It is a moot point whether the extension of the joint stock principle has been for good in the relations between employers and employed. A good deal has been said of the patriarchal relations of the employer to his men which is alleged to have obtained in the old days, but I confess that I cannot find in the early history of the factory system any clear proof that this alleged relation was of much value to the employee. Robert Owen showed what could be done but he was a bright exception to the rule of inhuman conditions which prevailed. Joint stock enterprise has meant the elimination of small masters. The small master, by virtue of his position, is likely to be a much worse employer of labour than the managing director of a great concern who takes pride in the organisation which he controls. As far as collected facts go, it certainly appears that in this country, as in other countries, the period of expansion of joint stock enterprise has witnessed a larger increase of rates of remuneration than before obtained.

The question remains, now that we have proved in practice that men can be trusted with the economic exploitation of other people's capital, whether the impersonal share-owner is necessary. A progressive community needs a large annual saving of capital in order to maintain and increase its productivity. The need is a primary one. How is it met?

There is no agency or organisation either to secure a necessary amount of saving or to see that what saving there is is properly invested. What happens in practice is that individuals here and there save more or less of their incomes, either to provide for a rainy day or because they find a superfluity arising after spending freely out of ample resources, the individuals concerned have no means of regulating their irregular or spasmodic contributions to the resources of the country. Their chance contributions come to be handled by bankers and financiers, but these rarely or never act in the national interest, and even if they desired to do so they have no means of regulating loanable capital to national needs.

There can be no question that the nation needs in town and country the application of many times more capital than has yet been saved. The joint stock principle has helped us so far that undoubtedly much more has been saved than would have been the case without it. Impersonal ownership has enabled big undertakings to arise which small masters could never have given us. It remains to be seen whether the nation as a whole cannot devise a means of using capital for the common good in quantities yet undreamed of.

Auditors, their Duties and Responsibilities.

The contents of this small book of about 50 pages justify the title that has been given to it. The author Mr. K. C. Bhalla A.L.A.A., deserves the thanks of the public for this timely publication based upon the two standard works on the subject—the one by Prof Dicksee and the other by Francis Pixley.

The object of the author in bringing out this book is to correct the erroneous impression prevalent among the Indian mercantile Community that an auditor's duty is only to sign the balance sheet after checking a few entries in the book of account placed before him. The new companies act requires that qualified auditors alone should certify to the correctness of balance sheets of companies; and with the growing commerce of India the services of trained auditors are likely to be more and more requisitioned. It is desirable therefore that the duties and responsibilities of auditors should be clearly stated as has been done in the book under notice. It is priced at Re. 1 and may be had of the author at 110-A, Harrison Road, Calcutta.

"Atank Nigraha Pharmacy and its all."

We have received from the proprietors of the Atank Nigraha Pharmacy of Jamnagar a copy of an album of the above name It contains photos of Their Majesties the King and Queen and Mr. Manisankar Govindji the founder of the firm and views of the head office and several branch offices.

Openings for Business.

[For particulars, address the Director-General of Commercial Intelligence, New Imperial Secretariat, 1, Council House Street, Calcutta, mentioning the *Wealth of India*. Firms that may like to follow up any enquiry should give proper references and restrict themselves to those enquiries only which they are fully and seriously qualified to handle.]

SEPARATORS.

An American firm desires to appoint an Agent in India for separators driven by petrol or electric engines. (C 118).

HARVESTING MACHINES.

An American firm desires to appoint an Agent in India for mowers, reapers, etc. (C119).

COIR MATS.

A firm in New York is desirous of communicating with manufacturers of coir mats. (C. 120).

INDIAN MEDICINAL SEEDS AND MATERIALS.

A London firm is desirous of communicating with exporters of Indian medicinal seeds and materials (castor seeds, senna leaves, cardamom and all drug seeds). (C. 122).

TALLOW.

A merchant in Allahabad is desirous of communicating with sellers of tallow for soap manufacture. (C. 123).

RICE AND OIL MILLS.

Firms that can supply rice and mustard oil mills of comparatively small size are requested to furnish the Department of Commercial Intelligence, Calcutta, with particulars and quotations. (C. 124).

FLESHINGS.

A large glue making concern in the United Kingdom desires to establish direct relations with producers and shippers of Indian fleshings, etc., for the manufacture of glue. (C. 125).

SHELLAC.

A Hamburg merchant is desirous of communicating with exporters of shellac who are not represented in Germany. (C. 126).

PINS.

A firm in Gloucestershire is desirous of communicating with importers of safety and other pins. (C. 129).

CASHEW NUTS, COFFEE AND TEA.

A merchant in Trieste is desirous of communicating with exporters of cashew nuts, coffee and tea. (C. 130).

CORUNDUM.

A Bombay firm is desirous of communicating with sellers of corundum in Mysore and Madras. (C. 131).

ROSIN AND TURPENTINE.

A Forest Officer in India is desirous of communicating with (*a*) importers of American rosin and turpentine in Calcutta, Bombay and Karachi; and (*b*) buyers who require annually at least 5,000 gallons of turpentine and 1,000 maunds of rosin. (C. 132).

GARNETS.

A Bombay firm is desirous of communicating with buyers of garnets. (C. 135).

AUTOMATIC MACHINE FOR MAKING LABELS, BOXES OR WRAPPERS.

An English firm of manufacturers of Automatic Machinery for the production in one operation of multi-coloured labels, wrappers, boxes, etc., is desirous of getting into touch with manufacturers, who use such labels, etc., and might require machines of the kind indicated. (C. 136).

GUNNY BAGS.

A merchant in Agra is desirous of communicating with buyers of second-hand gunny bags. (C. 139).

MATS AND MATTING.

A firm in Baltimore, United States of America, is desirous of communicating with manufacturers and exporters of coir mats and matting. (C. 140).

CEMENT WATERPROOFER.

A London merchant is desirous of communicating with buyers of a patented cement waterproofer and of appointing agents at Calcutta, Bombay, Rangoon, Karachi and Madras for their sale. (C. 144).

GRAPHITE.

A New York firm is desirous of communicating with exporters of graphite. (C. 146).

COIR MATS.

A firm in Johannesburg is desirous of communicating with shippers of coir mats. (C 152)

The Economic World.

India's Material Progress.

A statement exhibiting the *Moral and Material Progress and Condition of India* during the year 1911-12 and the nine preceding years has just been issued as a Parliamentary Blue Book (Price 4*s.* 6*d.*) The decennial record shows a growth in population of over 7 per cent.; in revenue from £64,500,000 in the first year to £83,000,000 in the last; in total seaborne trade, excluding treasure (largely used for payment purposes), from £143,000,000 and £164,000,000 in the first and second year to over £248,000,000 in the last. In the year ended March 31st last, it was, in exact figures, £275,538,600, or nearly double the 1902-03 total. The transfrontier trade correspondingly grew. The number of postal packages of all kinds given out for delivery grew from 560,000,000 to 965,000,000, and of money orders issued from 14,000,000 to 27,000,000. There was still more rapid advance in telegraphic business. The railways grew from 25,000 to 33,000 miles, and the aggregate capital outlay on irrigation from £29,000,000 to £41,500,000. The value of the minerals for which approximately accurate returns of production are available rose from £4,500,000 to £7,500,000 a year, the production of coal, for example, being doubled, and in many other branches of enterprise on a capitalistic basis there was marked development, "profoundly affecting the lives and habits of the people."

Indian Cotton Excise.

In the September issue we published Mr. Tattersall's letter to the *Times* on the Indian Cotton Excise duties. Sir Roper Lethbridge replying to Mr. Tattersall says:—"Mr. Tattersall knows as well as I that India cannot possibly afford to carry out the simultaneous abolition of import and excise duties, unless she is permitted by the Secretary of State to impose such moderate taxation on imports from and exports to protectionist countries outside the Empire as she may find necessary. I hope that Mr. Tattersall and his friends are now prepared to consent to this."

The Valuation of Estates.

According to Ernst Beck, an Austrian writer, the first reason of the rapid increase of the value of land is the fact that farmers at present are able to compare all the producing centres of the world as to their produce and its valuation and thus to form a better judgment of the value of land.

The second reason is in the improvement in the economic power of the class of tenant farmers, who, owing to the use of abundant capital, have increased the productivity of the soil and consequently enhanced its value permanently.

Still a third reason of the over-valuation of land is that generally the whole returns from an estate are considered as returns given by the land, and thus as a measure of its value, while the interest of the working capital should be deducted from the total returns before calculating the capital value of the land.

Under the term 'working capital' as distinguished from landed capital, the writer defines everything that can be separated from the estate and which on handing over the farm to the lessee remains moveable property of the lessor. On the other hand, all improvements of the land itself, plantations of trees, orchards, vines, etc., as well as permanent buildings, belong to landed capital. Only the interest returned by the latter, thus the simple rent value, represents the returns of the soil and is to be taken as the basis for the calculation of the purchase price, taking the rate of interest usual in the district for safe securities.

The fourth and most important factor for the over valuation of land is the rate of interest; to the extent that this sinks, does the purchase price of land rise; and as until

quite recently the rate of interest has been sinking while the number of inhabitants has increased and the means of communication have improved, the higher valuation of land is easily understood.

But in order to obtain the real returns of the land, which are to be capitalized, it is necessary to deduct from the total net revenue that portion due to labour, capital and agricultural capacity. It is only by keeping the installation capital and the working capital rigorously separated from each other that the difficulties encountered in the correct valuation of these capitals can be overcome.

Cost of Living.

"The average increase during the past seven years in the cost of workmen's rent, food, fuel, and clothing taken together may probably be put at about 10 per cent." This is the main conclusion of an interesting report issued by the Board of Trade, London, giving the results of an investigation of rents, prices of food and rates of wages during 1912. The rise in the general level of prices and cost of living in recent years is generally recognised to be a phenomenon, the effects of which are being experienced in all parts of the world. Precise and authentic information is difficult to obtain as to how the various countries compare with one another in this respect, but the investigators have been able to append a table showing, by means of index-numbers the extent to which the general level of food prices has risen since 1900 in certain foreign countries and British Dominions as compared with the United Kingdom. The index-number for 1910 being 100, the level reached by 1912 is thus indicated for the subjoined countries:—

	1912.
United Kingdom	115
Austria	135
Belgium	132
Canada	151
Australia	116

The latest available figures in some cases, were for 1911, and the increase as compared with the index-number of 100 for 1900 in these instances was as follows :—

Hungary	137
Germany	128
United States	139
New Zealand	116

In no instance, it will be noted, has the rise in the cost of living been less than in Great Britain, and in most cases it is far greater.

Is India Prosperous?

Writing on the speech which His Excellency Lord Hardinge made recently at Simla, as President of the Supreme Legislative Council, the *Hindu* points out that there is a fallacy in estimating the material welfare of a country by the volume of its foreign trade alone ; and that especially is this the case with India whose largest transactions are with its own creditor nation, namely, England.

His Excellency said:—"I am happy to think that the material prosperity of India has been quite phenomenal. During the year 1912, the imports of merchandise rose from £92 millions to £107 millions, while the exports rose from £151 millions to £164 millions, and the total trade from £244 millions to £271 millions. These last figures show a net increase of £27 millions or 11 per cent. In rate of progression India, therefore, compares favourably with any of the principal countries of the world."

The *Hindu* answers—"India contains 350 millions of population and the total value of her imports and exports divided amongst them leaves three-fourths of a £ or 12¼ rupees per head per year. This is not certainly such a large sum as to warrant their condition being described as one of phenomenal prosperity."

And the same journal proceeds to explain that the true measure for estimating the prosperity of a country "is the balance of the foreign trade rather than the imports or export or the two trades taken together. The imports of a country may partly consist of goods from foreign countries intended to be re-exported abroad ; or the exports of that country may consist partly of the products of foreign enterprise there, in which case they will represent only in a partial sense the prosperity of the

country, or a part of the exports may indicate foreign indebtedness as it does in India The total, absolutely considered, may be a very big figure, but when taken in relation to the population, it may not signify much, as we have shown above. A substantial portion of the imports represents the loan which India takes every year from England. For the prosecution of public works and for administrative purposes, India borrows largely from the ruling country which, instead of sending specie, sends merchandise and treasure. On the other hand, a similar portion of the exports of India represents the interest paid by the country on the amounts borrowed as above. Of these two items, the accumulating annual amount of interest being larger than that of the amount of the loan in a year, the excess is represented by a corresponding excess of exports over imports. There is, then, India's political drain, the tribute that she pays as the price of the benefits she derives from the overlordship of Great Britain. Again the manufactured goods exported from India represent only to a small extent the capital and skill of the people of the country; they mostly represent those of British capitalists who bring their capital here and make profitable use of the raw materials and cheap labour abounding in the country. According to the latest reports, the value of the total manufactured goods exported from India is a little over 57·33 crores of rupees, which is 23·7 per cent. of the total exports. But even of this small total, the proportion representing industries that bring to the people profits consumed by them, is fractional. If we next consider the imports, they are not goods which are mainly consumed by the bulk of the people. They are chiefly intended to meet the wants of the Government, of the Railways, of the frontier territories, of the European residents of the chief cities, of the Native Princes and nobility, and of the Anglicised inhabitants of cities. If allowances were made for consumption under these heads, the balance bought and consumed by the great bulk of the people, by the eight-tenths of the total population of British India, would be hardly worth mention".

Value of India's Agricultural Produce.

We take the following from the *Indian Trade Journal*:—

In our issue of the 10th July we made an effort to ascertain by calculation what proportion of India's agricultural produce is exported. It was pointed out that the range of reliable data about the prices of agricultural produce was very incomplete, and that, for this reason, the calculation could not be made in terms of value. It was found that the only mensurable term common to all crops was the acreage occupied by them, and that in most cases it was known approximately how much of a given product was obtained from an acre of land. On this assumption we ascertained, as regards each important description of produce, what area was required to give the quantity exported. The total acreage devoted to export produce of all kinds was then arrived at by addition; and the proportion borne by this to India's total area under actual cultivation was established. We found that some 10 to 11 per cent. of India's cultivated area was devoted to producing exports.

Without ascribing to such calculations a very high degree of accuracy or indeed supposing them to afford grounds for any very definite or even concrete statistical conclusions, all students of economics find them useful as well as interesting. At the worst, it is a real aid to any general consideration of the material position of a country that is primarily agricultural, to be able to conceive the volume of "value" represented by her crops, and to institute a mental comparison with her exports, with her imports, with her revenue, and so on. But even in dealing with countries like the United States, in which the data for an estimate of total agricultural value are comparatively full, it is necessary to be scrupulously on one's guard against thinking of such computed figures as exact.

In our issue of 12th August, 1909, we published an article in which an effort was made

to estimate the value of India's whole production of certain specified crops : namely, cotton, jute, wheat, rice, linseed, rape and mustard, sesamum, ground-nut and tea. This calculation has been carried out yearly since that time; and in the five years the average total value of these specified crops has exceeded Rs. 520 crores (say £347,000,000). But the selection of the crops included in this calculation results simply from the accident of their being relatively important in the export business of the country, and being therefore the subject of special price records. Consequently the mind cannot, without resort to paper, use their valuation as the ground for a reasoned conjecture as to the total value of the other crops. And yet it is very desirable to arrive at some such conjecture.

It seems possible that it might be reached by prosecution of that study of areas of production which we employed in our issue of the 10th July. In respect of certain kinds of produce, we have records of prices in up-country centres; and since we know approximately the average yield per acre, we should be able to say roughly what is the average produce value of an acre. Dividing the total value of each of these special crops by the total number of acres occupied by them, we ascertain the average produce value per acre. The statement in the next column shows the nature of the calculation.

The average produce value per acre of the specified crops is Rs. 36-1-11. Now it must be borne in mind that this average is struck on an aggregate of crops that represent only 70 per cent. of India's cultivated acreage. It is quite possible that the actual produce values of some of the other crops diverge from this average so widely as to vitiate it. But the long and short of it is that we cannot do better. As a matter of fact there is no good reason to suppose that there exists any such divergence as we have recognised as possible; and it is palpably better to base our valuation per acre upon 70 per cent. of fairly reliable data than to "adulterate" this with 30 per cent. of guess-work. There is, therefore, no positive reason for supposing that the average value so found may not be accepted as typical of Indian produce values in general. Assuming that it is so, and multiplying it into the aggregate number of acres under actual cultivation in India we find a total produce value of Rs. 1,167·73 crores, or say £778,487,500.

Kind of produce (for which wholesale prices are recorded).	Total reported area under crop (including Native States).	Average yield per acre in lbs.	Average wholesale rate per lb.	Value per acre of yield.
1	2	3	4	5
	Acres.		Rs. A. P.	Rs. A. P.
Grain and pulse—				
Barley	8,881,902	981	0 0 5	25 8 9
Gram	17,303,638	620	0 0 5	16 2 4
Jawar and Bajra	42,550,837	661	0 0 6	20 10 6
Rice	80,245,400	994	0 0 9	46 9 3
Wheat	* 30,415,983	726	0 0 7	26 7 6
Sugar (raw gur)	2,638,820	2,308	0 1 2	168 4 8
Tea	575,132	479	0 7 6	224 8 6
Opium	409,355	25	20 14 4	522 6 4
Tobacco	1,066,307	1,200	0 2 3	168 12 0
Indigo	284,669	19	1 15 1	36 14 7
Cotton	* 22,040,667	81	0 5 4	27 [illegible] 0
Jute	* 2,974,000	1,173	0 1 4	97 12 0
Seeds—				
Linseed	3,682,157	276	0 1 7	27 5 0
Rape and Mustard	6,782,942	392	0 1 0	24 8 0
Sesamum	6,039,123	204	0 1 5	18 1 0
Average value per acre				36 1 11
Total cropped area of India—Acres				323,294,000
Value of whole produce of India Rs.				11,67,73,11,93

* Total area as reported in forecasts.

These figures are based generally on the records for three years ending 1911-12.

The Influence of the World's Resources on Population.

Startling forecasts regarding the impending future of man, his vital necessities and welfare are not uncommon now-a-days ; and another prophet in the field appears in the person of Professor H. N. Dickson. In a paper read at the recent annual meeting of the British Association, the Professor said that in the type of civilization with which they were most familiar there were two fundamental elements —supplies of food energy and supplies of mechanical energy. Since at present, partly because of geographical conditions, these did not necessarily (or even in general) occur together, there was a third essential factor, the line of transport.

With regard to the world's food supply, he quoted the conclusion arrived at by Sir William Crookes in 1898, namely, 'Should all the wheat-growing countries add to their(producing) area to the utmost capacity, on the most careful calculation the yield would give us only an addition of some 100,000,000 acres, supplying, at the average world yield of 12·7 bushels to the acre, 1,270,000,000 bushels, just enough to supply the increase of population among bread-eaters till the year 1931.' Half the allotted span had now elapsed, and it might be useful to inquire how things were going. Fortunately this could be easily done, up to a certain point at any rate. If they took the decennial period 1901—10 they found, according to figures given by Dr. J. F. Unstead, an increase of 658 million bushels, or about half the estimated increase required by 1931, and that attained chiefly by 'increased acreage.' But signs were not wanting that increase in this way would not go on indefinitely. There was, on the other hand, abundant evidence that improved agriculture was beginning to raise the yield per acre over a large part of the producing area. Between the periods 1881—90 and 1901—10 the average in the United States rose from 12 to 14 bushels ; in Russia from 8 to 10 ; in Australia from 8 to 10. During the same period the average yield increased in the United Kingdom from 28 to 32 bushels, in Belgium 30 to 35, and it was most marked in the German Empire, for which the figures were 19 and 29. It was of course impossible to form any accurate estimate of the area which might, by the use of suitable seeds or otherwise, become available for extensive cultivation. But he thought it was clear that the available proportion of the total supply from 'extensive' sources had reached or almost reached, its maximum, and that we must depend more and more upon intensive farming, with its greater demands for labour. The average total area under wheat was estimated by Dr. Unstead as 192 million acres for 1881—90, 211 million acres for 1891—1900, and 242 million acres for 1901—10. Making the guess, for they could make nothing better, that this area might be increased to 300 million acres, and that under ordinary agriculture the average yield might eventually be increased to 20 bushels over the whole, it appeared that on a liberal estimate the earth might in the end be able to feed permanently 1,000 million wheat eaters.

That is to say, the crisis would be upon us before the end of this century ; what is wanted is the shuffling of population so as to give place to a more uniform distribution of things, tending always to the condition of a moderately dense population, more uniformly distributed over large areas, and self-supporting in respect of grain food at least.

With regard to the sources of mechanical energy, the Professor stated that in England their present yearly consumption of coal was of the order of 300 millions of tons, and it was computed that at the present rate of increase 'the whole of our available supply will be exhausted in 170 years.'

This spelt a change, the Professor stated, of no less an order of magnitude than the discovery of steam-engine, or of the steam locomotive.

He meant the conversion of energy into electricity, and its transmission in that form (at small cost and with small loss) through great distances. The Plain of Lombardy pro-

duced raw materials in abundance, but Italy had no coal supply The waterfalls of the Alps, however, yielded much energy, and this transmitted in the form of electricity, in some cases for great distances, was converting Northern Italy into one of the world's great industrial regions. Chisholm gave an estimate of a possible supply of power amounting to 3,000,000 horse-power, and said that of this about one-tenth was already being utilized in the year 1900. But assuming again, with Sir William Ramsay, that coal must continue to be the chief source of energy, it was clear that the question of accessibility now wore an entirely different aspect. However inaccessible any coal-field might be from supplies of raw material, it was only necessary to establish generating stations at the pit's mouth and transport the energy to where it could be used.

All these facts lead the Professor to the conclusion, that there must begin in the near future a great equalization in the distribution of population This equalization must arise from a number of causes. More intensive cultivation would increase the amount of labour required in agriculture, and there would be less difference in the cost of production and yield due to differences of soil and climate. Manufacturing industries would be more uniformly distributed, because energy, obtained from a larger number of sources in the less accessible places, would be distributed over an increased number of centres. The distinction between agricultural and industrial regions would tend to become less and less clearly marked, and would eventually almost disappear in many parts of the world.

These changes, said the Professor, would tend to make the road motor of incalculable importance in the future development of food-producing areas, and declared that the number of distinct geographical causes which gave rise to the establishment and maintenance of individual great cities was steadily diminishing, but that the large seaport was a permanent and increasing necessity.

The Flight of Capital.

A new argument why the labourer should not make exacting demands on the capitalist and employer is advanced by the *Paper Maker's Monthly Journal.* The condition of the labourer is such that he is to a great extent tied to a locality ; but the manufacturer or employer is less confined to any particular locality and the independent capitalist who frequently supplies the funds for both employer and employee to work with in these days of joint stock enterprise is not restricted to any particular industry or locality, but can elect to invest his capital in any industry in any part of the world.

Regarding conditions in England, the journal remarks that whilst they have been engaged in this country, for several years past, in settling labour disputes of various kinds, and endeavouring to satisfy the demands for increased wages and lesser hours of labour for employees in various industries, debating as to what additional taxation should be imposed upon employers and capitalists, presuming that the funds were within easy reach and that no way of escape was possible, a silent exodus of capital has been streaming out from the country, the wary capitalist having been quietly selecting new fields for investment in the Dominions and other countries to the extent of many millions. Recent official returns issued by the Commissioners of Inland Revenue show that there has been a decline in the income from British investments, and a large increase in the income from investments in colonial and foreign securities and industries generally. Evidently the capitalist judges that where masters and men cannot work amicably together, and taxation is continually on the increase, he stands but a poor chance of getting a good return for his money.

To this extent labour is a loser ; and the journal adds that the extremists of the Labour Unions who advocate exacting immoderate demands from employers are in reality only damaging their own interests. For labour to place itself in antagonism to capital is as though a man cut of his nose to spite his face.

The Prosperity of India.

India has been carried along the general wave of credit that has been sweeping over the world, ever since the resumption of mining in the Transvaal after the South African War. The results, according to a writer in the *Commerce*, is that India has been able to obtain greater credit in the world's markets, both on account of the influx of capital and the greater expansion of her trade. Her productive power has greatly multiplied and in the last ten years the traffic carried by the railways has doubled ; indeed, in recent years the expansion in railway traffic has been so great that the railways have had difficulty in dealing with it. The value of the foreign trade of the country shows an equally great improvement. It is true that prices of commodities have advanced, but this has largely contributed to the well-being of the Indian people, as the exports of the country are much greater than the imports. Moreover, the prices of the exported goods have risen more appreciably than the prices of the imported goods. The much greater expansion of exports than of imports, coupled with the continuance of good credit, enabled India in the twelve months to March last to purchase from abroad on balance no less than £34,000,000of the precious metals, against only £10,500,000 in 1902-03. The greatness of the trade of India in the year to last March, and especially the vastness of the exports and the ability of the country to purchase an unprecedented quantity of the precious metals, are shown by the following tabular statement :—

FOREIGN TRADE OF INDIA IN HUNDREDS OF THOUSANDS OF £'s.*)

	Merchandise					Treasure			Total
Year to March 31	Impts.	Re-expts.	Net Impts.	Expts.	Excess Expts.	Impts.	Expts.	Excess Impts	Total Excess Expts.
	£	£	£	£	£	£	£	£	£
1913 ...	111,1	3,2	107,9	161.3	53,4	41,1	7,1	34,0	19,4
1912 ...	96,0	4,0	92,0	148,0	56,0	35,6	6,9	28,7	27.3
1911 ...	89.1	2,8	86,3	137,2	50,9	26,5	4,8	21,7	29,2
1910 ...	81,7	2,2	79,5	123,0	43,5	25,0	4,3	20,7	22,8
1909 ...	85,8	2,1	83,7	99,9	16,2	15,1	4.2	10,9	5,3
1908 ...	91,0	2.5	88,5	115,8	27,3	28,2	3,6	24.6	2,7
1907 ...	78,2	2.3	75,9	115,7	39,8	29,7	3,8	25,9	13,9
1906 ...	74,7	2,3	72,4	105.5	33,1	21,1	10,3	10,8	22,3
1905 ...	69.6	2,2	67,4	102,9	35,1	26.3	11,0	15,3	20,2
1904 ...	61,7	2,2	59,5	100,1	40,6	25,7	10'0	15,7	24,9
1903 ...	57.2	2,0	55,2	84,3	29,1	16,9	6,4	10,5	18,6
1902 ...	59,2	2,2	57,0	81,0	24,0	13,7	7,6	6,1	17,9
1901 ...	53.9	2,1	51,8	69,4	17,6	16.4	9.5	6.9	10,7
1900 ...	50,2	2,2	48,0	70,5	22,5	14,0	5,3	8,7	13,8
1899 ...	48,1	2,2	45,9	72,9	27,0	11.9	4,9	7,0	20,0
1898 ...	49,1	2,5	46,6	62,5	15,9	13,7	4,8	8,9	7,0
1897 ...	50,7	2,7	48.0	66,6	18,6	8,7	3,3	5,4	13,2
1896 ...	48,6	3,1	45,5	73,0	27,5	8,9	2,8	6,1	21,4
1895 ...	49,0	3,4	45,6	69,2	23,6	6,4	5,5	9	22,7
1894 ...	51,3	2,9	48,4	68,0	19,6	12,3	2,7	9,6	10,0
1893 ...	44,1	3,1	41,0	68,0	27,0	11,3	4,6	6,7	20,3

Thus it will be seen, that in the space of two years, India has purchased from other countries nearly £48,000,000 of gold on balance, and, allowing for her own productions, she has absorbed over £52,000,000 of gold, or over one-fourth of the world's total production. Beyond this, in the two years, she has purchased from abroad nearly £15,000,000 of silver at the current price of the metal. The great sums of gold imported into the country in the last four years, and the large amount of silver purchased last year, is shown by the following statement of the imports and exports of gold and silver since 1893:—

*15 Rupees taken as equal to £

IMPORTS, EXPORTS AND NET IMPORTS OF GOLD ANDSILVER.

Year to Mar. 31	Gold Imports £	Gold Exports £	Gold Net Imports. £	Silver Imports £	Silver Exports £	Silver Net Imports. £
1913 ...	27,528	4,860	22,668	13,582	2,228	11,344
1912 ...	27,663	2,490	25,173	7,985	4,427	3,558
1911 ...	18,594	2,610	15,984	7,921	2,142	5,779
1910 ...	16,687	2,234	14,453	8,328	2,032	6,290
1909 ...	5,603	2,699	2,904	8,560	1,514	8,046
1908 ...	13,835	2,257	11,578	14,355	1,376	12,979
1907 ..	12,356	2,451	9,905	17,364	1,361	16,003
1906 ...	9,833	9,527	306	11,268	786	10,842
1905 ...	14,541	8,071	6,470	11,797	2,956	8,841
1904 ...	13,432	6,811	6,621	12,252	3,150	9,102
1903 ...	8,795	2,952	5,843	8,124	3,487	4,637
1902 ...	5,538	4,247	1,291	8,196	3,401	4,795
1901 ...	7,932	7,371	561	8,452	2,114	6,338
1900 ...	7,633	1,339	6,294	6,350	3,965	2,385
1899 ...	5,893	1,557	4,336	6,037	3,384	2,653
1898 ...	4,858	1,582	3,276	8,833	3,184	5,649
1897 ...	2,994	1,467	1,527	5,729	1,825	3,904
1896 ...	3,353	1,669	1,684	5,560	1,171	4,389
1895 ...	1,171	4,487	3,316*	5,217	998	4,219
1894 ...	2,097	1,670	427	10,210	1,064	9,146
1893 ...	1,188	3,063	1,875*	10,152	1,576	8,576

The writer draws attention to the largeness of the sums of gold imported into India since 1899. In the last fourteen years as much gold was purchased from foreign countries as in the previous forty years. Since 1859 the total amount of gold purchased from abroad on balance has been £261,000,000, and of this aggregate no less than £130 000,000 has been secured since 1899, when the gold standard became really effective and doubts disappeared as to the success of the Government in maintaining the exchange value of the rupee at 1*s.* 4*d.* The great sums of gold imported by India in the last 54 years, and the enormous amount secured in the last four years, are shown by the following statement :—

Period		Total Net Imports of Gold £
1909-13	... ...	78,278,000†
1904-09	... ...	31,163,000
1899-04	... ...	20,610,000
1894-99	... ...	7,507,000
1889-94	... ...	10,533,000
1884-89	... ...	15,420,003
1879 84	... ...	20,631,000
1874-79	... ...	3,198,000
1869-74	... ...	15,369,000
1864-69	... ...	29,175,000
1859-64	... ...	29,448,000
Total 54 years		£261,322,000

India thus absorbs now 25 per cent of the World's Gold Supplies.

The writer concludes :—Of course national prosperity is not governed by the amount of gold and silver imported, but by real income and consuming power. In this respect the position of India at the present moment is one of unusual strength. In recent years the production of the country has shown great expansion, and the power to purchase goods other than the precious metals has not been nearly exhausted. Moreover, there has been no excessive influx of capital from abroad into the country, prosperity having come almost entirely from the great increase in India's productive power, not from foreign loans. At no time has the credit of the country been higher than it is at present. It is true that the prices of Indian Government Stocks are low, in common with the prices of all Government securities, but this is merely a question of rate, not of power to borrow. If, as seems probable, a less active condition of trade brings about an accumulation of capital and an advance in the prices of securities, India will doubtless take advantage of such a period to raise large amounts of new capital required for railway extensions.

*Excess of exports. † 15 rupees taken as equal to £ 1 throughout.

The Financial World.

Gold Currency and a Gold Mint.

The following is a summary specially written for the *Wealth of India* of the evidence tendered before the Royal Commission on the question of a Gold Currency and Gold Mint for India:—

The opinion of the Government of India on the free coinage of gold by establishing a mint in India is contained in paragraph 22 of the Despatch to the Secretary of State published on page 287 of the *Wealth of India* for April 1913. Whilst disclaiming any idea that the coinage of gold in India will be a panacea for all Indian Currency ills, the Government of India added, " Indeed we do not imagine that its influence will be greatly felt at first ; but such a measure will mark a step along the path which has been authoritatively accepted as the line on which our currency policy must develop, & in time it will be of great assistance in maintaining the stability of our currency system." This argument of the Government of India did not appeal to Mr. Lionel Abrahams as convincing, since it overlooked the fact that Indian exchange tends to fall because India is a debtor country. If trade went against her, she found a difficulty in paying her debts abroad. If she had a gold currency, she might have to export her currency if the holders of it were willing to let it be exported; but if she did that, there would still be the fall in exchange that there was at present. In Mr. Abrahams' opinion, a fall in exchange cannot be prevented by exporting currency.

He stated that the existing arrangements secured a stable exchange between India and the gold-using countries without the existence of an extensive gold currency in India.

He thought that people in India, like people elsewhere, should have the opportunity of acquiring gold money if they wanted it and that India should arrange her currency system in accordance with the wishes and convenience of the people concerned without thinking too much of the wide-reaching economic effects.

Mr. Abrahams said that there was a gold currency in existence practically up to the requirements of the people and the Government gave all the encouragement it could, to put into circulation such gold as it possessed. The obstacle to gold being more largely used as currency was not, in his opinion, that the Government of India failed to encourage it, but that the people of India preferred other forms.

Mr. Abrahams indicated that his general position was that, in the matter of gold, it was better to increase the reserves than the gold circulation. His view was that an addition to the gold currency at the expense of the gold standard reserve would make exchange less stable.

Regarding the suggested 10-rupee piece, Mr. Abrahams thought that it would be cheaper to coin it than sovereigns and it should be of the same fineness as the sovereign to enable exchange by weight. He doubted the popularity of the 10-rupee piece, when the half-sovereigns were not able to become popular.

Questioned whether the Treasury objections would apply equally if an Indian mint were to coin a special gold piece, not sovereigns, Mr. Abrahams stated that the Treasury, in that case, would have no jurisdiction.

Regarding the gold mint for India, Mr. Abrahams expected very slight advantages from it. Coins other than sovereigns could be minted there, but sovereings could be imported freely to a great extent.

Sir Shapurji Broacha elicited from Mr. Abrahams that bullion would not be sent to India for coinage at the Indian mint from abroad, as such a course would be economically unprofitable after covering freight and loss of interest and the Indian mint would have very little business to do.

The two objections to the opening of a gold mint in India were, in Mr. Abrahams' opinion, first, that if it were for sovereigns, it would be very costly, and secondly, that it might by its failure to attract a large amount of gold for coinage, wound that very popular sentiment that it was intended to please.

Mr. O. T. Barrow regarded gold as a wasteful form of circulation, and did not desire to circulate as much gold as is possible in India. It was impossible, in his opinion, to estimate the amount of gold that would go into currency and as ornaments or into hoards. The use of the gold currency in India, he stated, would increase the drain of gold from Europe, unless gold for it was got out of the Indian hoards.

He emphatically stated that a gold mint for coinage of sovereigns in India was unnecessary and that it was absurd to import gold to coin it in India. The amount of gold that would come from the Indian supply was so small that it would not be worth while to establish a mint in India. However, such a mint might be tried if a special coin were introduced, but he did not advocate its introduction.

Mr. Bhupendra Nath Mitra desired the encouragement of a gold currency as there was evidence that gold was replacing silver in circulation in India at present.

Mr. Mitra advocated a gold mint for India for the reason that it would help in the maintenance of the gold exchange standard to have a larger circulation of gold in India, and would indicate to the public at large that the Government was certainly earnest in its endeavour to foster gold circulation in the country. It would also attract to the mint the amount of gold produced in the country itself, and this amount would be turned into sovereigns there. He proposed a charge for refining the gold, but nothing in the way of seigniorage. He advocated the coinage of sovereigns, the coin of international trade. He thought that gold would probably come from hoards, if a mint were established, in times of stringency, as also the local gold. He considered the establishment of a mint almost a necessity.

Mr. Alfred Clayton Cole stated as his opinion that the amount of gold in circulation would not be affected by a gold mint and that, if established, it would coin local gold and possibly gold from South Africa. Gold would not be sent from London if coinage charge, exceeded cost of freight, etc., and of coined gold. Mr. Cole did not think, as far as England was concerned, that a special Indian coin would make any difference in foreign exchanges, because gold was not taken at its face value in international markets; but by its weight and fineness. He was not personally opposed to a mint coining gold in India, but so long as sovereigns were taken for the currency, local minting seemed to him unnecessary. But if a mint were set up, sovereigns should be coined.

Mr. L. G. Dunbar knew no demand in India for a gold currency and thought that it was not required considering it as a wasteful and expensive luxury.

It did not matter very much to James N. Graham whether a gold currency was established, but he would like to see it so far current as one would be enabled always to change a gold coin.

He recommended the opening of a mint for the free coinage of gold as a matter of public convenience. Any one who had gold bullion in any shape might go to the mint and get it coined. Sovereign or a coin identical with it in weight and fineness should be coined in it.

Sir Daniel M. Hamilton advised the Government to discourage the use of a gold currency and his objections were general such as pertained to all countries. He objected to the establishment of a gold mint in India.

Mr. H. F. Howard expressed himself in agreement with the argument that a gold currency would decrease the liabilities of Government for redemption of rupees. He had not in view any special steps for the encouragement of gold currency.

An increase in the gold circulation, in Mr. Howard's opinion, would possibly be of

advantage in preventing the rise in the world's prices. He stated that the reserves kept by the Government would cease to increase by the extended circulation of gold. He did not think a gold currency a necessary concomitant of the gold standard, but stated that all endeavours should be made to meet any demand for gold that there might be on the part of the public. He did not suggest the extension of gold at the expense of the note circulation. He thought that the rupees might be interfered with to some extent and that the 10-rupee piece, if coined, might compete with the 10-rupee note more than the sovereign might do.

He advised the creation of a gold mint for the coinage of sovereigns and thought it might be convenient to pass the gold obtained from the Indian mines through the Indian mints. Bullion and ornaments might be attracted from the hoards and, in any case, he suggested that the experiment should be tried. He stated that seigniorage should not be charged on the coining of sovereigns.

Mr. W. B. Hunter maintained that gold was a wasteful medium of circulation and that gold in reserve was infinitely more valuable for the stability of the exchange than any amount of gold in circulation.

He saw the advantage of a gold mint theoretically and thought it was reasonable that the holders of precious metal should be enabled to turn it into the coin of the realm; and in India especially in times of scarcity those that hold gold should be able to convert it readily into coin or its equivalent. He suggested a probable difficulty in obtaining bullion for coinage and said that it would do to issue rupees in exchange for receipt of gold.

Mr. F. C. Le Marchant mentioned that the sovereign is in increasing use as currency in an effective manner in the Punjab, Northern India and Bombay. There were fluctuations in the extent of the use of gold currency in the different parts of India and he would not ask the Government to press the circulation of gold.

He attached little importance to the creation of a gold mint and thought that the special Indian coin, if minted, might conflict with sovereigns. The 10-rupee gold piece would not be available for exportation on favourable terms, but only would be taken over at its pure gold value, or, may be, slightly above; it might, moreover, compete with the 10-rupee currency note.

Mr. Charles Campbell McLeod did not advise the creation of a gold mint at present, but stated that, if established, sovereigns should be coined. He anticipated difficulty in obtaining bullion for coinage. His objections to the coining of a special Indian coin were those of the Bengal Chamber of Commerce which thought that for a long time to come an Indian coin would have to be treated as bullion when exporting, which, in their opinion, was a convincing argument against the coining of a special Indian coin. The 10-rupee piece would tend to destroy the standing of the sovereign and would be used for ornaments and hoarding.

Sir Alexander McRobert thought it advantageous that the people should use gold as currency, because it was more portable than silver and was the standard of value throughout the world. He stated that the small man—the workman-believed in metallic currency. He did not advise the coining of the 10-rupee piece as there would be some inconvenience in having the sovereign and a ten-rupee gold coin circulating side by side.

He advocated the establishment of a gold mint from the point of the view of prestige and sentiment and believed that it would justify the cost.

Mr. F. W. Newmarch stated that the amount of gold in circulation is increasing in India and desired the encouragement of the same. He did not see how the Government could encourage it or discourage it except by allowing gold to go in the ordinary course of trade. The Government liked gold to be better circulated in India, but did not wish to press it upon the people.

He thought that the institution of a gold

mint would greatly increase the supply of sovereigns in India.

Mr. Marshall F. Reid opined that it was not wise to give gold coinage and circulation as prominent a place as was sought to be given recently. He feared in them a real evil in the encouragement of hoarding It was not desirable to replace gold coins in place of currency notes and gold currency, in his opinion, was wasteful when compared with other methods and not as useful for the support of exchange as gold in reserve.

Mr. Harry Marshall Ross objected to the forcing of gold on India, and stated that the Government should not encourage gold currency. But, in his opinion, gold should not be objected to, if people really desired it. He considered other forms preferable to a gold currency.

He was of opinion that a gold mint might be advisable if it was inexpensive. He objected to the 10 rupee piece on the ground that it might check the circulation of the 10-rupee note.

Mr. Thomas Smith said that the circulation of gold was increasing in India, especially in the Punjab and desired the encouragement of it in the interests of the people. He preferred the advancement of the note circulation, but stated that the people should be given gold when they desired it.

He advocated the creation of a gold mint for the conversion of gold that might be hidden or absorbed now. There were times, he said, when it might be more expedient to import bullion and have it coined in India. He stated that sovereigns should be coined.

Messrs. Toomey and Fraser did not think a gold mint necessary at present but if one was opened in future, sovereigns should be coined there. They stated that gold imported from abroad would not go to the mint for coinage at normal times, because it would be cheaper to import sovereigns. Gold would not be attracted by the mint from the hoards and gold from the local mines would be the only source in the ordinary way to which the mint could look to. They stated that as a general rule it would be cheaper to import sovereigns than take bullion for coinage in the mint.

Mr. M. De P. Webb considered gold currency essential to a proper currency system and advocated its encouragement by the Government. The Gold Standard Reserve would be unnecessary with the establishment of an effective gold currency. The increase in the gold currency would result in the decrease of the note and the silver circulation. Circulation of gold would increase and he anticipated the increase of gold in the Paper Currency Reserve. It was not likely, he stated, that rupees would fall to a discount and no steps, in his opinion, should be taken by the Government to check gold. He did not intend that a gold currency should involve the obligation to give gold in exchange for rupees.

He advocated the opening of a gold mint at Bombay for the free coinage of gold and thought that money would be attracted from hoards in times of danger and emergency. He said that the produce of Indian mines would be tendered for coining. He was of opinion that no seigniorage should be charged on coinage and the sovereign or a coin identical with it in weight and fineness should be coined.

Mr. Sundara Iyer did not consider a gold currency practicable and did not advocate the increase of the circulation of gold. He thought that neither notes nor rupees were likely to be displaced by gold. He doubted the popularity of the 10-rupee piece, if coined.

He also doubted the advantage claimed for a gold mint that it would largely increase the gold currency and stated that it would do to have the gold standard with the gold reserve.

Loans from Cash Balances.

A Finance Department Press *Communique* states :—"During his visit to Bombay in August last, the Finance Member was approached by the Chamber of Commerce on the matter of making the cash balances of Government more readily available for the assistance of trade

during the busy season, when the demand for funds to finance trade tends to become acute. In his reply to the Chamber, Sir William Meyer indicated the limitations to which the grant of Government assistance must necessarily be subject and emphasised the fact that it would be incorrect to estimate the capacity of Government to grant loans during the busy season by the state of their cash balances at that time. At the same time he indicated the readiness of the Government of India to consider the matter favourably. With reference to the legitimate requirements of trade during the ensuing busy season, the Government of India, having referred the matter to the Secretary of State, it has now been decided that if this course appears necessary to prevent undue stringency in the money market during the next few months, the Government of India will be prepared, so far as the demands on their own balances permit, to make temporary loans to the Presidency Banks to a moderate extent on the security of Government paper. The terms of such loans will be for not more than a few weeks, though renewable if necessary, they will bear interest at a rate of one per cent. less than the Bank rate and will in any case be repaid by the end of May. This decision has reference to the coming busy season alone, and is without prejudice to the future permanent policy in such matters, which will be a subject for consideration when the Royal Commission on Indian Currency and Finance have completed their labours. It was also taken without any reference to the present banking and commercial crisis which had not arisen when the matter was put before the Secretary of State."

In this connection, it might be interesting to know what the United States Government are doing to ease the financial strain of marketing American crops of 1913. We understand that this will be done by Secretary McAdoo's use of treasury funds to meet the special seasonable demands of the great farming States. In August last, the allotments of money were started to the West, Southwest, and South. A little more than half of the $50,000,000 fund went to the fourteen Western States, and a little less than half to the thirteen Southern States. The money is to remain on deposit for four or five months, and is to be returned not later than April, in monthly instalments. In each depository city, a special representative of the Government will serve with a clearing-house committee of five, to pass on commercial paper offered as security, and there must be unanimous approval of this joint committee before a loan is made. Mr. McAdoo let it be known that while the first allotments went to the West and South, the Government would be quite as ready to extend this temporary "accommodation" to Eastern cities if application came from them.

Trade and Currency.

The Report of the Comptroller-General and Head Commissienor of Paper Currency upon the operations of the Currency Department during the year 1912-13 has been issued as a supplement to the *Gazette of India* of October 25th. The main features of general interest of the report are :—(1) The large increase in the cash balances in the Government treasuries during the year was not produced by withdrawing funds from circulation in India. (2) The demands for rupees in financing the jute trade were very heavy, and Government were obliged to undertake new coinage of rupees by purchasing silver worth £7,000,000. (3) The absorption of currency of all kinds in the year amounted to 24½ crores against an average of 21¾ crores in the preceding three years. (4) The absorption of gold increased in every province save Madras, the total for all India being 15⅓ crores, out of a total absorption of all forms of currency of 24½ crores. (5) The analysis of this absorption by circles, trade seasons and denominations of currency, and the inferences drawn therefrom, contain several matters of interest. (6) The use of gold as currency is extending, specially in Northern India and Bombay, and in those parts at least gold as to some extent replaced in the circulation rupees and small notes,

The part which gold plays in the circulation is discussed in some detail. (7) The rate of development in active note circulation was well maintained in 1912-13, and there was a steady increase in the circulation of small value notes used for every-day transactions. But the growth of the circulation of small notes seems to have received a check owing to the more extended use of gold as currency. The use of notes for remittance purposes is increasing.

The following paragraphs are extracted from the Report :—

CURRENCY AND THE CROPS.

In the three months, April to June 1912, about 5 crores in silver were required for the spring crops in Northern India and about 1½ crores for cotton and groundnut in Madras, and coin remittances in aid were required from other circles to the extent of 1½ crores in Cawnpore, 1¾ crores in Lahore, and 160 lakhs in Madras. Gold is used largely for financing the trade in Northern India, and a remittance of over 4 crores was also sent in sovereigns from Bombay for this purpose, made up of 333 lakhs to the Lahore Circle and 75 lakhs to Cawnpore. On the whole, the withdrawals from circulation in Calcutta, Bombay, and Rangoon proved just sufficient to meet the demands, and the balance of rupees in the Reserve on June 30th was 15,41 lakhs against 15,40 on April 1st.

With an opening balance in rupees of 15,41 lakhs on July 1st the abnormal demand for the Bengal jute crop of 12,70 lakhs had to be met from July to October, and every available rupee was withdrawn to Calcutta, at considerable expense. Even these heavy remittances did not supply the demands in full, and Government were obliged to undertake new coinage in September. The amount received by new coinage in the two months September and October was 2½ crores. Even with this, it was necessary to draw upon the opening balance to the extent of over 3 crores, and the rupee balance in the Currency Reserve on October 31st came down from 15,41 to 12,37 lakhs—a very low balance for this season of the year.

Gold is not taken for financing the internal trade in jute, and the accession of gold in the Currency Reserve by import during the jute season was about 6¼ crores. Against this 2,81 lakhs were sent to England in October and about two crores issued to the public in Northern India and Bombay, so that the stock of gold increased from 26,08 to 27,46 lakhs. During this period a remittance in gold of 75 lakhs was made from Bombay to Cawnpore.

With the close of the jute season in October begins the season for cotton seeds and wheat in Northern and Southern India, which is followed by the end of December by the rice trade in Burma. The last five months of the year from November to March is thus a period of active trade over a large area, and the demands for accommodation are very heavy. In November and December the revenue collections are comparatively small and consequently there is a heavy drain on the currency reserve of rupees. But from January to March the drain is accompanied by large revenue receipts, so that the net reduction of the currency reserve of rupees is not great.

Every circle of currency had been denuded of its available rupees to meet the demands of the jute trade, and it was therefore necessary to make considerable remittances to the trade centres from the proceeds of new coinage which continued to the end of March. The amount received by new coinage was about 4½ crores in November and December and 5½ crores from January to March. In spite of the addition of 4½ crores by new coinage the balance of rupees in the Currency Reserve went down from 12,37 lakhs at the end of October to 11,80 at the end of December. In the second period from January to March the large revenue collections caused a surplus, and there was a net addition to the Reserve of (16,45—11,80) 4,65 lakhs in the last three months.

The year closed with a stock in the currency reserve in India of 16·45 crores in silver 29·38 crores in gold, being increases during the year of 1·05 crores in rupees and 6 05 crores in gold.

The Financing of Foreign Trade.

To finance the foreign trade of the country in 1912-13 funds were imported by means of Council Bills to the extent of 38·83 crores and sovereigns to the value of 26·43 crores. Council Bills are paid directly from treasury balances at the three Presidency towns, and the treasury balances were sufficiently high in the year to admit of all the payments being met without any special assistance from the Currency or the Gold Standard Reserve. But it is necessary to concentrate the surplus treasury balances at Presidency towns to meet the payment. Council Bills are paid in the first place either by means of book credit or in currency notes, and thus pass immediately into the banks stores of value. In the same way, imported sovereigns mostly find their way into the currency offices, and currency notes issued in exchange are lodged with the banks as store of value. The stores of value at the Presidency towns are remitted to the districts in payment for articles of export, and silver or gold, according to requirements, is taken in exchange for the notes. The payments made for articles of export partly come back into banking centres in payments for foreign imports and partly into Government treasuries on account of revenue. The effect of these various exchanges of currency on the currency reserves of gold and silver is that the demand for rupees exceeded the receipts by about 11¼ crores, and it was necessary to supply this excess by resorting to new coinage. As regards gold the demands were heavy, but the imports from abroad were heavier still, and out of about 21½ crores received into the currency offices about 15½ crores were absorbed, leaving about 6 crores as an increase in the stock in India.

Increase in Total of Currency.

In the three years from 1909-10 to 1911-12 the average annual addition to the currency was 21·72 crores. For 1912-13 the total came to 24·52 crores. As already stated, £7,000,000 worth of silver was purchased in the year for coinage into rupees. The average price paid was 28½*d.* per ounce British standard 37/40th fine. The outturn at the Indian mints in totals Indian standard 11/12th fine was 15·85 crores, of which 4·90 crores were paid to the Gold Standard Reserve and the remainder 10·95 crores to the treasury and currency. Of the 4·90 crores paid to the Gold Standard Reserve 1'80 crores were transferred to the currency reserve in exchange for gold, thus making the total addition to rupees on account of new coinage 10·95 + 1·80 = 12·75 crores. The withdrawal of uncurrent rupees in the mints amounted to 3·40 crores, of which only 2,92 crores were re-coined into rupees and the net addition to the rupee currency was therefore (12·75 + 2·92—3·40) 12'27 crores.

The sum of 3·40 crores on account of uncurrent rupees withdrawn from circulation during the year included Rs. 1,05·12 lakhs tendered by a Native State at the Calcutta mint. This tender of uncurrent rupees came out of hoards, and the State instead of taking the whole outturn in rupees took only 25 lakhs in rupees, and the remainder partly in gold and partly in currency notes on account of the Native State.

Absorption of Gold.

The absorption of sovereigns in the year (£10,245,000) was more than a third in excess of that in 1911-12 (£7,600,000), there having been an increase in every province. In the Punjab the increase was about 60 per cent, in the United Provinces about 50 per cent, in Bengal and Burma it was also about 50 per cent, while in Bombay it was only about 14 per cent, and in Madras the figures were practically the same in the two years. Of the total of £10,245,000 Punjab took by far the largest amount, namely, £3,372,000 next in order comes Bombay, United Provinces and Madras with £1,658,000, £1,616,000 and £1,571,000, respectively. The absorption in India and Bengal figure, *viz.*, £1,090,000, was large, but deducting from it the special issue to a Native State of 50 lakhs mentioned in paragraph 22 the balance was £756,700 against £677,000 in 1911-12. Burma absorbed

£814,000 in 1912-13 against £573,000 in 1911-12.

It is now possible to indicate generally the use which is made of the sovereign in India at the present moment, and the task is made more easy by the fact that all the evidence is in accord with the conclusions to be arrived at by theoretical reasoning. In the first place, there is a large mass of population who never enter into any transaction involving a receipt or expenditure of Rs. 15. To that class the sovereign will never penetrate. As regards the other classes the use made of the sovereign varies considerably in various provinces as has been already indicated. But the following general conclusions seem to be permissible. Take the trading community. They are well aware of the intrinsic value of the sovereign, and, even though they might not be able to get rid of one readily in local trade transanctions, they would probably accept a sovereign if offered in the course of business. One can now say more than this. In every town of importance in India, except in a few outlying districts, the sovereign can be used in retail transanctions.

Then there are the comparatively well-to-do people. The sovereign is entering more and more into their ceremonial life as, *e.g.*, for presents at marriage ceremonies. They are finding that the sovereign is a very convenient and portable form of value, hence its use on journeys and pilgrimages and for remittance purposes, is increasing. Its use in retail transactions has already been discussed. These people know that Government accepts the sovereign readily, so small payments to Government are often made in this medium. There can be no doubt that sovereigns pass into hoards to some extent. Local custom as regards their use for ornaments seems to vary considerably in various parts of India. As was to be expected Government servants, pensioners and other payees have taken the lead in the acceptance of sovereigns.

Finally, we come to the most important portion of the Indian population—the agricultural community. The variations from province to province of the absorption of gold are due very largely to the use of the sovereign by this community. Every large expansion of such absorption has been due to an increased use of gold in the purchase of crops, and has thus been the direct outcome of the initiative of the wholesale purchaser. It is to the latter, more than to any other, class that the extended use of gold is due. And so far experience has shown that an attempt to use gold in such purchases, if persevered with, has always succeeded. There is even a strong volume of evidence that in parts of the Punjab the sovereign is preferred to the rupee, and a purchaser offering gold has an advantage over one offering silver. The use of gold in the purchase of crops in now pre-eminent in the wheat trade in the Punjab, it is large and increasing in the cotton trade of Bombay and the cotton and spring crops in Northern India, and it has obtained a footing in the west of the Madras Presidency. It has at last touched the rice trade in Burma.

It must not be thought that every sovereign which is absorbed is hoarded or melted down. A very large sum of money is in actual use in India. Banks have cash reserves, traders have till money, private persons have their petty cash. There can be no doubt that sovereigns now form some, and an increasing, portion of this daily balance of cash in hand ; and sovereigns so in use certainly must not be regarded as hoarded. Again, a certain amount of gold must leave India in the pockets of travellers.

It is not for me to discuss whether a gold currency is necessary for the maintenance of exchange. But the conclusion must be drawn from these figures and accumulated opinions that the sovereign really has entered into the economic life of India. The withdrawal of the sovereign would now be viewed with disfavour by many, to whom currency controversies are unknown, who yet realise that this coin is superior to any other.

SOVEREIGNS AND NOTE CIRCULATION.

The question arises whether the increased use of gold has affected the note circulation at all. On the whole, it may now be definitely stated that, but for the use of gold as currency, the circulation of the smaller currency notes would have expanded much more rapidly in the Punjab, Bombay, and the United Provinces.

The Educational World.

Educational Progress in British India.

According to the tables of educational progress in British India, the total of pupils in all institutions has risen within twelve months by over 435,000, and now stands at 6,781,000. The increase for the quinquennium 1906-07 to 1911-12 was 1,393,000. The percentage of pupils to those of school-going age (reckoned at 15 per cent. of the population) has risen in the case of boys from 22·7 in 1906-07 to 26·8 in 1911-12; in the case of girls the corresponding figures are 3·2 and 4·7 per cent. The highest figures for girls are 16 per cent. in the small province Coorg and 8·5 per cent. in Burma (where the social system differs greatly from that of India proper), while the United Provinces are last on the list with 1·4 per cent. The general increase of pupils is mainly contributed by the primary schools. While in 1910-1911 the numbers under primary instruction rose by 1·9 per cent., in the following year, in pursuance of the progressive policy of Sir Harcourt Butler's department, they advanced by 7·8 per cent.

Head Measurement.

When a youngster is offered as a pupil, our teachers probe his intelligence with oral or written questions. It seems that the proper course is to begin by measuring the head, between the size of which and the intelligence, close relations, it is contended, exist. Bayerthal has recently published the results of his investigations in the case of 12,000 school children. By measuring the horizontal perimeter of the head, he has established a scale of mental capacity. Very good powers of mind will not be found with circumferences smaller than those here tabulated :—

Age 7 years.	10 years.
Boys 48 centimetres.	Boys $49\frac{1}{2}$ centimetres.
Girls 47 ,,	Girls $48\frac{1}{2}$,,

12—14 years.	
Boys ...	$50\frac{1}{4}$ centimetres.
Girls ...	$49\frac{1}{2}$,,

If a class of children be taken and an average head-measurement for it be ascertained, the clever children, it appears, will rarely be among those with less, the dull children hardly ever among those with more, than the average size. It is suggested that judges, in deciding whether the evidence of a child witness should be admitted, might use the tape measure as one of their guides. A centimeter is ·39 of an inch.

The Ideal Indian University.

Speaking recently at the City Branch of the Y.M.C.A. at Bangalore to a large Hindu audience on " The ideal of an Indian University," the Bishop of Madras advocated more centralised universities as distinguished from provincial universities which should be the home of learning and centre of intellectual life and culture like Oxford. " The medium of instruction for the pass degree," said the Bishop, " should be the vernacular of the people and not English. It was inevitable perhaps that University education in India should have been given in English to begin with, but after all, this is not the ideal. It is only a regrettable necessity. The literature and poetry of India would be far better for them as a means of culture than literature and poetry of England." Touching religious instruction, His Lordship remarked that " to banish religion from Indian Universities is to banish the one subject on which the Indian people have for centuries thought most deeply and earnestly, about which they feel most intensely and with regard to which they are to-day in most utter need of help and guidance. Indian students should also be helped and encouraged to study the politics of their own country in a scientific spirit and reasonable temper. At present in our Indian Universities the very stars in their courses fight against learning. The whole system of the Government Education Department strongly militates against it."

Education of Labourers.

Speaking on the education of labourers at the Fyzabab conference, the Hon'ble Rai Bahadur Lala Bishambar Nath observed that the labouring classes in whatever line they may be are steeped in ignorance. They would not and could not therefore adapt themselves to their new environments. They do not easily take to new and improved scientific methods for carrying on the various industries in which they are engaged. They stick to their old ways of doing things. This is an age of hard competition—competition with countries far ahead of us not only in matters political but industrial and commercial as well. Westerners have got better organization, bigger capital and more intelligent labour. Unless, therefore, we equip ourselves better and rise equal to the occasion there is no hope of our ever becoming industrially and commercially an independent people. If arrangements be made for giving elementary education to our labouring classes, we shall have taken a step in the right direction by making our working men more efficient. Therefore, we not only request the Government to open free elementary schools for the benefit of our labouring classes but urge on the employers of labour, zamindars and the people generally to do the same in their self-interest if not out of philanthropic motives.

Education of Factory Children.

With a view to a further and more thorough discussion of the question of the education of children employed in factories, the Government of Bombay have consulted the Bombay Millowners' Association and the Municipal Corporation of Bombay and, with the co-operation of these bodies, have referred the matter to a Committee consisting of their representatives and others. The Committee consists of the following gentlemen :—The Director of Public Instruction—Chairman. The Collector of Bombay, the Hon'ble Sir Sassoon J. David, Baronet, the Hon'ble Sardar Sir Chinubhai Madhalai, Baronet, C.I.E., the Hon'ble Sir Ibrahim Rahimtoola Knight, C.I.E., the Hon'ble Sir Fazulbhoy Currimbhoy Ebrahim, Knight, Mr. D. E. Wacha, and the Chief Inspector of Factories, Bombay Presidency (who will be Secretary to the Committee). The Committee is to examine generally the question of the education of factory children and more particularly to—(1) consider and report on the possibility of arranging for the education of all children employed in factories; (2) suggest the measures necessary to give effect to their recommendations; (3) report upon whom primarily the responsibility for, and cost of, the execution of such measures should be imposed.

An Institute of Mining for India.

A proposal has for some time past been under the consideration of the Government of Bengal for the establishment of an Institute of Mining and for the further expansion and development of the existing system of evening classes for mining at Asansol A similar suggestion was made by Lieutenant-Colonel Atkinson and Mr. Dawson in their report on Technical Institutions. Meanwhile, the question of mining instruction in the colliery districts has been engaging the attention of the Government of Bihar and Orissa, who have consulted the Chief Inspector of Mines and the colliery owners of the leading Giridih and Jherria coalfields; and the Mining and Geological Institute of India have passed certain resolutions on the subject. The outcome of these discussions has been a general consensus of opinion that a single mining institute, located probably at Asansol or Dhanbaid, should be established for the two Provinces, and that the evening classes should at the same time be developed. For the final and satisfactory determination of this question and for the preparation of a definite scheme, the assistance of a Joint Committee of the two Provinces is required, on which mining interests should be largely represented. Accordingly, the Governments of the two Provinces of Bengal and Bihar and Orissa have decided to appoint a Committee, with the Hon'ble Mr. D. J. Macpherson, C.I.E., as President, to advice on the scope, designation, and location of the institu-

tion and to draw up a scheme for its establishment and maintenance.

The Proposed Technological Institute of Calcutta.

Our readers may be aware that some time ago a Committee was appointed by the Government of Bengal to report on the advisability of creating a Technological Institute in Calcutta. The Committee thereon drew up an admirable report which has influenced the Government to start a Technological Institute in Calcutta, much on the lines favoured by the Committee of experts.

The Hon'ble Dr. Nil Ratan Sircar, M.A., M.D., gives in the November number of the *Modern Review* a very suggestive note on the proposed Institute. After thanking the Government for its wise decision, Dr. Sircar notes that, "although the scheme before us does not fulfil our expectations of a high class Technology, the institution will no doubt be helpful in opening new lines of industry in the country and new avenues of employment for our young men."

The writer regrets that the Government have omitted to take advantage of all the points raised in the recommendations put forward by Messrs. Nathan, Kuchler and Everett and urges upon the Government to include those also so as to make the institution complete in every one of its features.

Their recommendations, with which Dr. Sircar is in full agreement, and some of his own, are—

(1) the inclusion in the institute of higher training in Electrical and Mechanical Engineering ;

(2) the opening of a higher Civil Engineering branch ;

(3) the combination of the different branches of higher Engineering in the same institution.

The writer makes out that the proximity of the proposed Dacca College of Engineering has narrowed the Government in their view of the scope of the proposed Technological Institute in Calcutta ; and contends that the Technological Institute should be made ampler in its scheme of studies.

Trade Schools.

An article on the above subject appears in a recent issue of the *Manchester Guardian*. The following is a summary of the same.

Very few of the existing technical schools in England cater successfully for the youth who will be most of his life an ordinary skilled workman. This neglect of the artisan classes is, curiously enough, to a considerable extent, the result of over solicitude for their worldly advancement. Because of it, technical education has been moulded consistently with a view to the needs of the advanced grades, and the bulk of the skilled workers have gone unprovided with the simpler, more concrete, and more industrial kind of knowledge which their daily life demands of them and beyond which most of them can never go.

Industrial organisation has so changed that some degree of specialisation must be assumed. Again, the trade school will have to deal in the main with a young intellect, and youth learns infinitely better from the concrete or an apt illustration, than from even the most lucid and direct reasoning. It is also safe to assume that the trade youth or girl will not be too receptive and will certainly be narrow in reading and outlook. These facts serve to emphasise the importance of teaching by practice rather than by precept.

Specialisation must come towards the end of the training and need not be so close as that obtaining in a factory.

Experience will be necessary to give speed and manual skill and also to extend the thinking habit inculcated in the school, but the school should take the rawness and greenness from the youth and should arouse in him as much interest in his craft as possible. This last is very important. It is hopeless to sigh for the old times when the artisan spread himself over a whole industry. Interest must be aroused on a narrower, or rather a more specialised, basis, and so it seems inevitable that the specialisation must commence at the school.

The Equation of the Individual to the Nation.

In a brilliant article published in the *Journal of Education*, which reveals much insight into the problems of education, Miss Geraldine E. Hodgson, L.D., writes that the idea of education is the equation in life of individual ability and bent to national need.

The educator, on this plan, needs two kinds of knowledge, of which, as a general rule, he is quite devoid :—(1) a scientific knowledge of the nation's needs, which can be supplied by workers of all grades; (2) a more intimate personal acquaintance with the children he brings up, which must drop all conventional notions about what " all children are like" or what " all children must do and learn." We are not all of us like any one thing, nor " must " we all learn many of the same things. It would no doubt facilitate the teacher's work if we could, in Comenius's famous phrase—which never has reached any stage beyond a phrase—" teach all men, all things, all at the same time"; but the ensuing horror of dullness and apathy can hardly be really grasped even by an active imagination.

" No doubt the present-day educator is far less aware of what, to borrow an economic phrase, I may call the future needs of the market, than he is of the idiosyncrasies of his pupils. Nevertheless, and with all due respect to everybody, he is, with a few brilliant exceptions, far too little aware of the latter, even if the importance of the first needs most preaching at present. Education is not only one, but one of the most fundamental and important, of the 'human sciences,' and they are never 'exact.' Father Figgis has had the courage to point out that whatever else the future of human beings may be, it is not 'predictable.' 'Part of life may obviously be made subject to calculation, and of another part you can say what will probably occur, and in much more, you can state that one of two things is more than probable. More than that you cannot do. And every attempt to do more breaks down in face of the amazing uncertainty of life.' But, because we cannot do everything we wish, we are not justified, as we so often appear to imagine, in doing nothing at all. No care and ingenuity can ever reduce human life to pure mechanism, a fact for which it is impossible to be too thankful. But it does not follow that, because human life is not, and ought not to be, a machine, that therefore it should be, what we so often allow it to be, an unordered, unforeseen, unprovided for muddle, where ends exist without any means for their attainment, and where means are set in motion which arrive at no useful goal."

Mercenary Education.

Mr. Khuda Buksh who delivered the Presidential address at the Educational Conference held at Bankipore in the course of his speech said:—

The great outstanding feature of our present system is the mercenary character of our education. Learning for its own sake is disappearing—if it has not already disappeared—from us. We seek learning, no longer, as our forefathers did, in the spirit of a true knight, braving every danger, running every risk, suffering every form of privation, with no motive other than to broaden the mind, to serve God and to serve the country. Learning with them was an end, and not merely a means to material gain or material advancement. And yet, gentlemen, they were free from the dreadful roll-calls, long and tedious attendances in the lecture room, grinding examinations ruinous alike to the health and to the understanding of the victims.

With them learning was thorough, solid, substantial, though limited in range ; with us it is discursive, shallow, superficial. With them it was a serious, solemn call; with us it is a mere incident in the crowded scheme of life. Hence the dearth of scholarship, hence the poverty and barrenness of our universities in men of real towering intellect. Have we ever stopped to consider the reason of this mournful condition? Is the reason impalpable, impervious to our understanding ? No, it is as clear as day. In the task of education we have never taken

the least trouble to ask ourselves what we are aiming at; what kind of human being we desire to produce. It is all hazard, a game of chance. Smattering of half-a dozen subjects, mastery of none; absence of our own Eastern learning, thin veneer of Western culture. Such is our education, and what real good can come out of it to us or to our country! To pass examinations as quickly and with as little labour as possible, to obtain the degree and then, in majority of cases, to uselessly spend some of the most valuable years of life in a futile quest,—seeking unsuccessfully Government employment—that apparently is the ultimate end, the final goal of our University career. Is this atmosphere congenial to higher studies, to prolonged research, to fruitful meditation or to philosophic contemplation? Certainly not!

But if the motives are such as do but little honour to the pursuit of higher studies—those to whom the cause of learning is committed are rarely of a type to kindle enthusiasm, to inspire love, to arouse devotion in their students. What great and conspicuous names adorn the educational service of India! What great pioneers in Art, in Science, in Philosophy, in Letters, can it claim as its own! It cannot enter into competition even with the poorest of German Universities in the brilliance of its staff, in the solidity of its work, in the richness of its achievements.

Agricultural Education in England.

England and Wales possess 14 Agricultural Colleges and Agricultural departments of Universities or University Colleges, which after three or four years' course give the degree of B. Sc. in Agriculture or the diploma of Agriculture. These are the Agricultural departments of the following:—(1) University College of Wales, Aberystwith; (2) University College of North Wales, Bangor; (3) Cambridge University; (4) University of Leeds; (5) Armstrong College, Newcastle-upon-Tyne; (6) University of Oxford; (7) University College, Reading; then the following Agricultural Colleges: (1) Royal Agricultural College, Cirencester; (2) College of Agriculture and Horticulture, Holmes Chapel, Cheshire; (3) Midland Agricultural and Dairy College, Kingston, Derby; (4) Harper-Adams Agricultural College, Newport, Salop; (5) Horticultural College, Swanley, Kent; (6) Agricultural and Horticultural College, Uckfield, Sussex; (7) South-Eastern Agricultural College, Wye, Kent.

All the above institutes have farms attached for practical and research work, and many of them, besides the usual course of studies, hold special courses of shorter duration.

There are four special institutions: (1) The British Dairy Institute, Reading; (2) Harris Institute, Preston; (3) National Fruit and Cider Institute, Long Ashton near Bristol; (4) Royal Horticultural Society's School, Wisley, Surrey.

There are further twelve farm and dairy schools and similar institutions founded and provided for by the county councils.

As regards agricultural research, a sum of £31,000 per annum is allocated from the Development Fund for the purpose of aiding research into certain definite groups of subjects.

The institutions and the subjects selected are as follows:—

Subject and name of Institution.

Plant Physiology, Imperial College of Science.

Plant Breeding, Cambridge University and John Innes Institution.

Plant Pathology, Royal Botanic Gardens, Kew.

Fruit Growing, including the practical treatment of plant diseases, Bristol University, in conjunction with the National Fruit and Cider Institute.

Plant Nutrition and Soil Problems, Rothamsted Experimental Station.

Animal Nutrition, Cambridge University and Leeds University.

Animal Pathology, Royal Veterinary College and Board's Veterinary Laboratory, Alperton, Middlesex.

Dairying, University College, Reading.

Agricultural Zoology, with special reference

to Economic Entomology, Manchester University.

Agricultural Zoology with special reference to Helminthology, Birmingham University.

Economics of Agriculture, Oxford University.

Compare these facilities with what exist in India for a population of over 300 millions most of whom are dependent on agriculture !

Open Air Schools.

In accordance with the recommendations of the Government of India for the prevention of the spread of tuberculosis among school-children, the Government of Bombay have distributed free among all schools both in urban and in rural areas, the lessons on tuberculosis, Malaria, and Microbes and the pamphlet containing a description of simple precautions to be taken against tuberculosis, prepared by the Surgeon-General. A text book on sanitation which contains the substance of the lesson on consumption approved by Government has also been prescribed for use in Anglo-vernacular and primary schools. Lessons on hygiene are included in the new science curriculum for secondary schools recently sanctioned by Government, and the new science readers which are under preparation will no doubt refer to the subjects of tuberculosis and malaria.

The Director of Public Instruction is willing to afford special assistance to any municipality, which may desire to undertake the experiment of establishing schools designed for tuberculous children and those in danger of becoming tuberculous, by paying three-quarters of the cost of the buildings and the same proportion of the cost of maintenance of the schools. The plans of the school buildings in such cases will have to be specially approved by the sanitary authorities, and the building grant will be subject to the condition that half of it will be liable to be refunded to Government in the event of the building ceasing, without sufficient cause, to be used for the special educational purpose for which it was designed and being appropriated to ordinary educational purpose.

Provision has been made for delivering a course of lectures on the common diseases of children before teachers in Bombay and Poona. Government will be glad to consider proposals for extending the experiment to other centres such as Sholapur and Ahmedabad. Further, the Director of Public Instruction has been requested to arrange, after due consultation with the District officers and the officers of the Public Works Department, to institute in a few selected localities as diverse in character as possible the experiment of a simple type of open-air-school.

Technical Education.

A recent issue of the *Indian Textile Journal* calls attention to some fundamental considerations which are at present neglected, in the schools where young men are taught arts, trades and industries. These are, says the journal, usually staffed with experts from England, who are often tied to their institutes and never can or do know any part of India. All they can do is to impress their English methods on the men who come to them in their peculiarly English way, without regard to the fact that what they learn they have to apply in India and not in England. The expert with his technical training acquired in English should have several years in which to master the ways of the country and the conditions of the industry before he is fit to teach in India.

The journal presents a contrast of two existing weaving institutes, the one created with the English idea of giving a thorough education and leaving the educated man to find an application for his skill, and the other developed on a definite paying industrial line, and compares their success.

In the one, a three years' course is given including the theory of weaving, the construction of looms, the theory of design, design drawing, freehand drawing, machine drawing, the theory of textiles, etc. It takes three years, the student, aided by a scholarship, learns weaving on an expensive iron loom, preparing a few inches of each class of fabric in one continuous length, these fabrics having no

reference to the fabrics of the country and being unsaleable. But when he leaves, he is not able to earn a living as a weaver; he knows theoretically all about it, but he does not know what fabrics are in demand, what the local trade customs are, where to buy his raw material, what to make, where to sell it or how to apply his skill, and he is useless except as a teacher.

In the other, the learner provides himself with a "country" loom as a sort of guarantee, then he sits down and works at it; having learnt plain weaving, he takes to twills, etc Of each fabric he must do one whole piece which is sold. He does only fabrics for which there is a local demand; he sells his pieces at the local market: when he leaves after six or nine months, he only knows how to make the locally required fabrics which he can at once sell by the most economical method, and if the institute finds a demand for a new thing, they tell their trained men and show them how to do it. They teach them no theory, no drawing, no fundamental education, but simply teach them how to weave, what they can sell, and so put them in the way of earning a living.

The latter is regarded as a proper institute: a poor man or a poor weaver could go there and be taught to earn Rs. 20 to 30 a month in his own house with a very small capital for his loom and raw material. So the journal pertinently asks, "why cannot other institutes work on similar lines?"

The paper deprecates the practice of sending young men to England, Japan or elsewhere to be industrially trained in the belief that thereby industries would spring up. "The sooner the folly of the present method is recognised the better" "It is one thing," says the journal, "to have technical knowledge; it is another to apply it, to be able to work an industry on profitable lines and to build up a business; the class of man now being sent away will never do this, and unless the industry is started for them so that they can apply their skill as employees, they will be worse off than if they had never been sent out of India. We know of several, for instance, who have been trained in sericulture in Japan and France, but we are not aware that they have been able as yet to do more than attempt to get into Government service, and they are not likely to take up sericulture as a busiuess of their own."

In the journal's opinion, this applies to all forms of industrial training.

Eye Sight in School Boys.

Much short-sight is caused by the misuse of eyes during the period of growth. Careful observations in particular localities have shown that for these localities, during the periods investigated, short-sight (1) is rare before the age of six; (2) increases in amount and degree in the higher classes or standards of schools, and is the only disease of which the incidence is higher among the older than the younger scholars; (3) increases with the number of hours employed in literary work; (4) is worse in badly lighted than in well-lighted schools.

Recognising that short-sight is to such an extent the result of faulty education, several authorities have laid down rules to be observed in the production of books to be used by children under twelve years of age. Thus, school books should have sufficient thickness of paper, and large, thick faced, well-defined type. Letters and lines should be well spaced, with good margins to the pages. Ink should be black, and paper white or tinted yellow. Unbleached paper of a tawny-grey tint has been recommended. Glazed paper is strongly condemned.

The lines of the school book should not exceed 4 inches (some say $3\frac{1}{2}$ inches) in length. No type should be allowed which necessitates holding the book at a less distance than 12 inches. Types recommended are "double-pica" for very young children, "pica leaded" for children of age six to eleven, and "small pica leaded" for the other children. Small-type annotations are undesirable.

A Plea for Commercial Education.

At the Y. M. C. A. Auditorium, Madras, the Hon'ble Mr. T. V. Seshagiri Aiyar delivered

recently an interesting address on some "Educational Problems in India," with the Hon'ble Sir C. Sankaran Nair in the chair. In the course of his address, the lecturer spoke of the need for Commercial and Industrial Education in these terms :—

"So far as the Madras Government were concerned, an attempt had been made seriously and strenuously to supply this defect, and a recommendation had been made to the Secretary of State that Commercial Colleges should be established and experimental factories started in which education in the industries might be given to the people, and that alone would satisfy the requirements of the country. But the Secretary of State, who spoke of such maxims as the Government not interfering with private trade, the Government not pioneering industries, etc., nipped the scheme of the Madras Government in the bud, and with it all progress of the people in the path of industrial advancement. He thought that the time had now come to take steps to give commercial education in the Colleges. For fifty years and more there had been model Colleges, maintained by the Government, which had enabled Indians and Missionaries and others to start Colleges of their own. So far as literary education was concerned, in his opinion, that must now be left entirely to these private bodies, and the vast sums which the Government were spending upon the maintenance of these Colleges and which they proposed to increase by establishing model schools, should be utilised for the purpose of establishing Commercial Colleges and experimental factories, where people could be taught industrial education. He would examine in a minute the statement that the State should not encourage competition with private enterprise, and should not subsidise private industries. If they had been reading the debates in Parliament, they would find that about five years ago the present Chancellor of the Exchequer had asked for large sums of money for the purpose of subsidising agriculture. It was called a development fund for the purpose of bringing land under cultivation, etc. Was that not subsidising ? Again, cotton growers were given large sums of money to encourage them to grow cotton. Was it not subsidising an industry ? Was not the State-aided construction of Railways in India really competition with private enterprise ? The truth was, the interests of Manchester and Lancashire were paramount, and no Government in England could dare to go against the wishes of Lancashire and Manchester. That was the reason why they were not willing to establish experimental factories and promote industrial education largely. He would sound a note of warning that if they wanted to improve sanitation and make the condition of the people happier and wealthier and to increase education, the Government would require large sums of money. They could tax the land no further, they should get their additional revenue from industries, etc., and unless the Government gave up those doctrines and came to the rescue of the people by giving Commercial Colleges and experimental factories, the Government would soon become bankrupt."

The Chairman, in his concluding remarks, was unwilling to speak one way or the other on the subject, and observed:—If he told them that the Government were not doing for them what they ought to do because they were afraid of Lancashire and other manufacturing interests of Great Britain, and that they wanted India only to produce raw materials to be sent to England for manufacture, to be returned as finished products to India for Indians to purchase and feed English labourers and manufacturers—If he said that, then as an official he would be guilty of the impropriety of speaking against the policy of the Government. If he said that he agreed with Government, the audience would simply say that he said so because he was an official. Therefore, he was not going to tell them what his opinion was in the matter.

INSURANCE.

Life Insurance a Bank.

According to the *Illinois Life Bulletin*, a life insurance office is a bank in which deposits are made every year to be withdrawn at the death of the depositor. It is a lottery reversed, since for unequal sums it sells equal prizes. It is a trading firm—always seeking customers. The whole object of insurance is to render certain that which nature has made uncertain. A person in health and employment knows that if he lives a few years he will be able to leave at his death a competency for his family, but he knows, also, that from the uncertainty of life he may be cut off in a year, in a month, and leave his family unprovided for. Thus situated he has recourse to insurance on his life, and he is then certain of leaving a provision for his family.

Loans on Policies.

Those who are insured in life assurance companies, and who find themselves temporarily in need of money have discovered for themselves that the borrowing of money from the companies on the security of the policies is the easiest, most satisfactory, and in many cases the cheapest method of raising ready cash. There is no waste of time whatever; the transaction is a simple one, rapidly carried out; the loan can remain as a debt on the policy for as long as the policyholder wishes, or be paid off at any time; and the rate of interest charged is never more than 5 per cent. and in some cases not so much. British policyholders avail themselves of this convenience to a very large extent, and the item of "loans on policies within their surrender value" is a considerable one in practically every British life assurance company's balance sheet.

Insurance Congress.

An Insurance Congress, with representatives from all parts of the world, is to be held in 1915 at San Francisco. This event, which promises to be of great interest, will be held under the direction of the Panama-Pacific International Exhibition. Commander W. L. Hathaway is at the head of the organisation work and has created an executive committee of five members, whose chairman is the executive head of the undertaking during the organisation period of the congress. This committee consists of the following gentlemen:—Chairman, William J. Dutton, President, Firemen's Fund, San Francisco; George I. Cockran, President, Pacific Mutual, Los Angeles; Hon. E. C. Cooper, Insurance Commissioner of California; W E. Dean, President, California Insurance Company, San Francisco; F. F. Taylor, second Vice-President, Metropolitan Life. The time set for holding the congress is October 1st to 15th inclusive, and for that period all the facilities of the city or the exposition are being reserved for the insurance representatives

Forgery Insurance.

We do not know whether there is quite the same need for insurance against forgery in this country (England) that there is in the United States, but, according to paragraphs and articles in American papers and magazines, the matter there is a very important one. When this form of insurance was brought out in the United States it appears to have been entered upon in rather light hearted fashion, but actual experience soon caused a very different view to be taken, one company giving up the business entirely, and another increasing its premium rates enormously. It is estimated that the total amount of loss to the American Banks in 1911 through forged notes and drafts amounted to no less than $15,000,000 and even this surprising total is regarded as under, rather than over, the mark. The chief restriction now imposed by the companies issuing forgery insurance policies is that the bank insured shall not open an account with any one not known personally to an officer or director, or whose integrity is not upheld by a depositor. A favourite method of forgers has been to deposit a bogus cheque, apparently certified, on a bank remote from the depository, and to withdraw the money two or three days later, or before the cheque was found to be a forgery. If some of the statements in *Munsey's Magazine* are correct, American banking methods seem very lax in some respects.—*Insurance Index.*

MACHINERY, SCIENCE AND INVENTION.

A New Cultivator.

From La Vie Agricole we learn of a new "automobile" cultivator. This machine, propelled by a small, light (2 to 4 horse-power) gasoline motor, is merely steered by the laborer who walks behind it. Any variety of attachments, such as hoes, shovels, harrow teeth, etc., may be attached to the base of the frame. This handy machine is mounted on three wheels, two of which are connected with the motor. According to the particular model, the width of the strip cultivated is from 60 to 110 centimeters. This apparatus may solve many of the orchardists' and horticulturists' difficulties in the way of rapidly and cheaply weeding and "dust mulching" fruit trees, gardens, and small plantations.

Small-pox Germ Found.

The germ of small-pox, a protozoan so infinitesimal that it has passed through the minutest filters and escaped the trained gaze of microscopists for decades, has been finally discovered by Dr. Walter Fornet, staff physician at the Kaiser Wilhelm Academy. Dr. Fornet claims not only to have discovered the germ but to be able to propagate it. This means, we are told, that it will henceforth not be necessary to inoculate a calf or cow with small-pox virus in order to secure lymph for vaccination, and consequently that a pure culture can be secured.

Paper Made from Grape Vines.

The demands of the modern printing press are so great that any new source of paper supply will be welcomed eagerly by the trade. The latest possibility in this line is presented by the grape vines. The wine-producing countries of Europe are now experimenting with a process invented by Prof. Chaptal, of the University of Montpelier, France. He has found that the cuttings of vines may be separated into fibres by a hot solution of acids, which produces a brownish pulp that is easily bleached and will make paper that is of finest quality. Germany, Italy, Spain and France have an enormous quantity of vine cuttings every year through the necessary pruning. A tree of paper-making size, on the other hand, represents 60 years' growth. A company will soon begin work upon 15 mills in the South of France, each of which will have within convenient distance the raw material for making four tons of pulp a day.

Artificial Meat.

According to the Paris daily journals a Belgian scientist, M. Effront, has succeeded in producing artificial meat, and this is another advance made by modern chemistry, after the synthesis of vegetable extracts or perfumes and even the albumens which are the base of living substance. M. Effront now uses a remarkable process for industrial preparation of nitrogenous foods at a very low price, and these are said to resemble ordinary meat in a striking degree. He uses different residues of manufactures which are almost worthless, such as brewery or distillery refuse products, and from these he extracts a food albumen. The refuse material is first washed, then pressed and treated by sulphuric acid and afterward by lime, being then put through other operations which are too long to enumerate, ending by filtering and evaporating *in vacuo*. The result is a pastry extract which has a very pronounced taste of meat and has three times the food value of the latter, owing to its concentrated state. At Brussels several doctors have already made experiments upon nutrition of the human body, and the results are quite conclusive. The same chemist produces a like food by the use of fodder, such as hay or clover as the raw material, and this product has a similar nutritive value as has been proved by various tests. Such researches are as yet far from the absolute synthesis which Berthelot predicted, but economists already forsee that the practical use of these nitrogenous products may go far to counteract the continual rise in prices of food at the present time. Perhaps the day is not distant when science will be able to produce from the mineral world not only foods of animal origin but those which come from the vegetable kingdom.—*S. A.*

HINTS AND RECIPES

The Collar-Stud.

If the thumb and forefinger be first dipped in water and then passed round the button-hole to slightly moisten it the collar-stud will easily slip into place.

Hints in Varnish Making.

Transparent varnishes or lacquers are readily made by dissolving gum copal or gum dammar in the proper solvents. However, it is not generally known that the solubility of gum copal in alcohol is greatly increased by first melting the gum. It loses about twenty per cent. water by this treatment and changes its properties. In fact, it becomes much more soluble in turpentine. It should be melted at as low a temperature as possible or black specks will appear.

How to Clean Brass.

To clean brass furnishings or to remove fly spots or tarnish from them they should be boiled for a few minutes in a solution of one ounce of alum to every pint of water. After boiling they should be polished by some brass polish or just a dry cloth. This will remove tarnish from all crevices where other means fail.

Five uses for Milk.

(1) Piano keys can be cleaned and whitened by rubbing them with milk. (2) A little milk added to starch will give a nice gloss to linen when ironed. (3) A glass of hot milk sipped when going to bed is very good if one is restless and cannot sleep. (4) Milk added to the blue water used for rinsing curtains will make them like new. (5) Ink spots or quite long standing can be removed by soaking them in milk.—*Miss Bull.*

Potatoes as Cleansers.

It is not generally known that potatoes possess great cleansing powers. Cold potatoes, used instead of soap, cleanse the hands well and make the skin smooth and soft. The water in which potatoes have been boiled is excellent for sponging dirt out of silk. Potato water, made by grating a potato into about half a pint of cold water and afterwards strained, is splendid for cleaning cloth and serge skirts, from which it will even remove obstinate mud stains.

Care with the Lamp.

A lighted and heated lamp needs to be carefully handled when being moved from its place, as the sudden exposure to a fresh, cold current of air is liable to cause an explosion or to fracture the chimney and globe. The flame should be lowered and the glass and globe allowed to cool a little before being gradually moved to a fresh place. When extinguishing a flame turn the wick low down, the light should then go out gradually unaided, in any case a slight sharp puff of breath across the chimney top will do.

Salt for Preserving Eggs.

Mr. E. T. Brown writing in our excellent contemporary the *Farm and Home* points out that when eggs are to be preserved for not more than three months dry salt answers the purpose admirably. This method, however, is suitable only when the eggs are required for home use, since the salt absorbes a certain amount of moisture from the egg, causing its contents to rattle somewhat, and giving the purchaser an impression of staleness. A layer of salt should be placed in the bottom of a box, then a layer of eggs, another layer of salt, and so on, until the box is full, when the lid should be screwed on, so that when the eggs are wanted for use it can be removed and the stale eggs used first. Smearing the shells with lampblack or soot preserves the contents fairly well, but makes the eggs valueless for marketing purposes.

The Bat Nuisance.

The only effective way of getting rid of bats in a house is to close every aperture in a room, or on top of a ceiling, leaving only one, of about 2 ft. square open. Over this aperture have a good string fishing net with meshes smaller than the bats and then drive the bats from inside. In attempting to escape by the net, they tumble over one another and are then easily killed. Shooting, fumigation and thorns are of little use. 79 bats were killed in one attempt to clear out the colony in a Forest bungalow.

HEALTH AND HYGIENE.

Calcium Chloride as Tonic.

Some interesting experiments in bodily nutrition have been carried out by Mr. Oscar Lœw in Porto Rico. A number of persons were given 22 grains of calcuim chloride daily in their drinking water. In most of the individuals the results were striking, gains in weight and improvement taking place where before there had been indigestion and poor assimilation of the food.

New Process for Preserving Milk.

To the already known methods of preserving milk another has been added by two Italian Physicians. Their method is to preserve milk by means of an atmosphere of carbonic acid gas, under pressure. The milk remains unaltered for several days, both in its physical and chemical characters, and in the biological constiuents, the ferments. Some of the germs present are killed, while others have their development arrested. By this method, uncooked milk can be kept for eight or twelve days at a temperature of 12° to 14° C., while boiled milk is preserved indefinitely. The gas is produced with little or no trouble. The inventors claim for this method a solution of the question of infant feeding. Milk preserved in this manner ought certainly to be superior to milk sterilised by heat, owing to the fact that milk can be kept by this process for a considerable period with all pathogenic germs absent, while its biochemical functions remain intact, which is not the case where heat sterilisation is used.

The Aroma of Coffee.

. The tonic and stimulating properties of coffee have been known for a long time. Learned men attribute all the virtues of this precious produce to caffeine. But M. Gabriel Bertrand of the Pasteur Institute, after a certain number of researches undertaken in collaboration with M. Weisweiller, has just discovered that an infusion of coffee owes its aroma, not only to caffeine, which has been studied for a long time past, but also to the presence of a volatile, alkaloid recognized by chemists as being *Pyridine*, the smell of which, however, in the mass, is disagreeable. It is probable that the infusion of coffee owes a part of its physiological action to pyridine, of which it contains a proportion corresponding to a quarter of a gramme per kilogramme of coffee.

M. Gabriel Bertrand has observed that by adding caffeine to boiling sugared water, the aroma of coffee is obtained, but if to this decoction some pyridine is added, in a proportion equal to that which is normally contained in coffee, the aroma of the coffee immediately becomes much stronger. It would seem then that traces of pyridine increase the aroma of coffee.

Different varieties of coffee contain variable proportions of pyridine. The quantity of pyridine contained in a kilogramme of coffee varies from 200 milligrammes to 250 milligrammes.—*The Chemical News.*

Malaria.

When the germs of malaria—real live animals these, belonging to the order protozoa—enter the blood with the saliva of the biting mosquito they instantly attack the red corpuscles. Each one, says one contemporary, eats its way into a corpuscle and after a brief rest divides himself into sixteen. What is left of corpuscle is now dead; it breaks down and the sixteen new germs—plasmodia, as the doctors call them—are set free in the blood. Each of these instantly seeks out a new red corpuscle, which it attacks in the same way. This process, in the ordinary malaria, takes just forty-eight hours. When the germs are eating the red corpuscles the temperature of the body is increased, causing fever. When the multiplied germs are discharged into the blood the whole body feels as if chilled; this causes the shivers and shakes that usually come every alternate day, and that have given us the common name "chills and fever." So when, you have the chill you may know that your broken-down red corpuscles are discharging myriads of germs into your blood, and when the chill gives way to fever you may know that these germs are busy attacking your red corpuscles.